Tree Debris Removal

Objectives of this training - At the end of this short session, you should be able to:

1. Identify the hazards involved with tree removal
2. Explain how to protect yourself from these hazards
3. Increase safety and health awareness

Source Standards & Resources

- USACE EM-385-1-1
- ANSI Z133.1
- ANSI A300
- OSHA 1910.266 & .269
- Oregon OSHA publication 2942
- DHHS (NIOSH) Publication No. 93-122

CAT
287B

Medical Services

- Two Trained First-Aid/CPR Trained (certified) on site at all times
- Crews must have a Emergency Services/Hospital route map
- First Aid Kit available

Hurricane Damaged Trees

A tree growing in a coastal zone is a marvel of structural integrity. By itself, it offers several methods of protection.

- First, a tree will shed its leaves to reduce wind load and therefore look like it is dead.
- The root zone of a tree is composed of a network of fibrous and structural water channels that anchor solidly into the soil, oftentimes at great depth.
- The root systems of native species are well adapted to the native soils of a coastal community.
- Just because a tree has no leaves & appears to be brown does not mean it is dead. It may take many years, but many trees damaged by the storm will recover & grow.

Potential Hazards

The safe felling of any tree includes evaluating out the surrounding area to identify potential hazards.

These hazards should be avoided or eliminated before attempting to fell trees.

Hazard: Throwback

As the tree falls through other trees or lands on objects, those objects or branches may get thrown back toward the worker.

- If possible, avoid felling into other trees or onto objects. Don't turn your back on the tree as it falls, and look up as you escape along the retreat path.

Hazard: Terrain

If the tree falls onto stumps, rocks, or uneven ground, a hazard may be created.

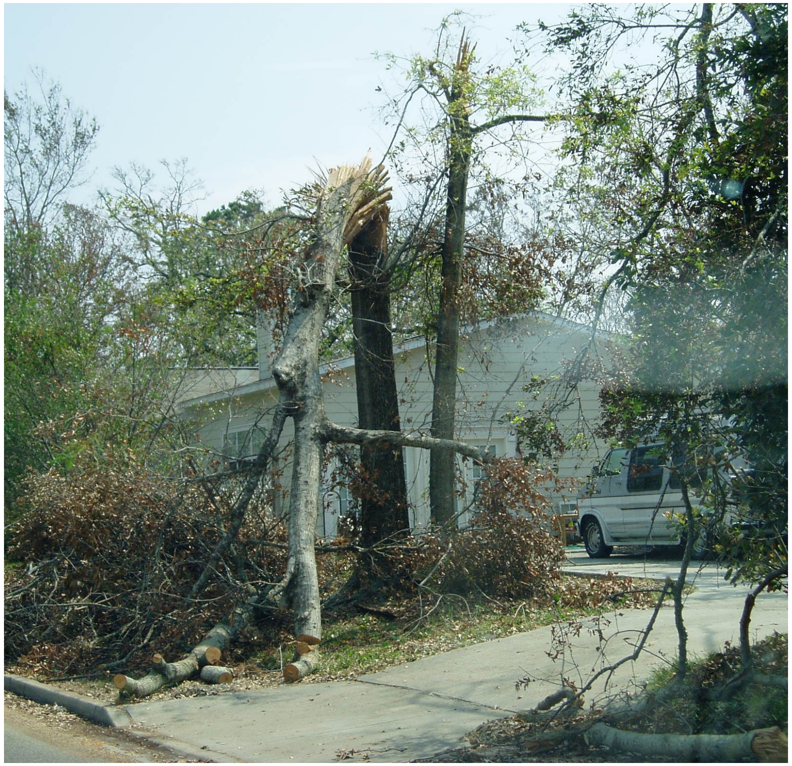
- If possible, move the obstacle, or change the felling direction.

US Army Corps of Engineers ®

Hazard: Lodged Tree

A tree that has not fallen completely to the ground because it is lodged or leaning against another tree.

- Do not work in the presence of lodged trees. Have these death traps pushed or pulled down by a machine.



Hazard: Widowmaker

Broken off limbs that are hanging freely in the tree to be felled or in the trees close by.

- Knock them down or pull them down with a machine. Avoid working underneath them.

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Hazard: Snag

Standing dead tree, standing broken tree, or a standing rotted tree to be felled or nearby.

- Use a machine to bring it down.

OR

- It must be felled or avoided by at least two tree lengths, unless the employer can demonstrate that a shorter distance will not create a hazard for an employee.

Hazard: Spring Pole

A tree, segment of a tree, limb, or sapling which is under stress or tension due to the pressure or weight of another tree or object.

- Use a machine to release the tension or release it with a chain saw.

Hazard: Strong Wind

Extreme Weather: Strong wind.

- Do not fell trees during high winds.

Hazard: Entanglement

Vines or limbs of other trees intertwined with the limbs of the tree to be felled.

- Undo the entanglement if possible.

OR

- Use a machine to fell the tree.

A- Frames

- Stabilizing with equip

Power Lines

- Consider all conductors to be energized until proven otherwise.
- Only qualified personnel permitted to work in electrical hazard areas.

EM 385-1-1

- Never work alone in an electrical hazard area
- Consult EM 385-1-1 for safe working distances from energized conductors.

Hazard Analysis: Tree Removal

- Step 1 – Install a pull line in the top of the tree to be removed; anchor it.
- Step 2 –Clear the tree trunk, immediate area and exit route of obstructions.
- Step 3 – Make the face cut, or notch.
- Make the back cut; exit the area before the tree falls.

Safe Work Practices

Fuel-Powered Tools

- Stop all fuel-powered tools while refueling, or servicing.
- Use all tools with the correct shield, guard, or attachment recommended by the manufacturer.

Power chain saws

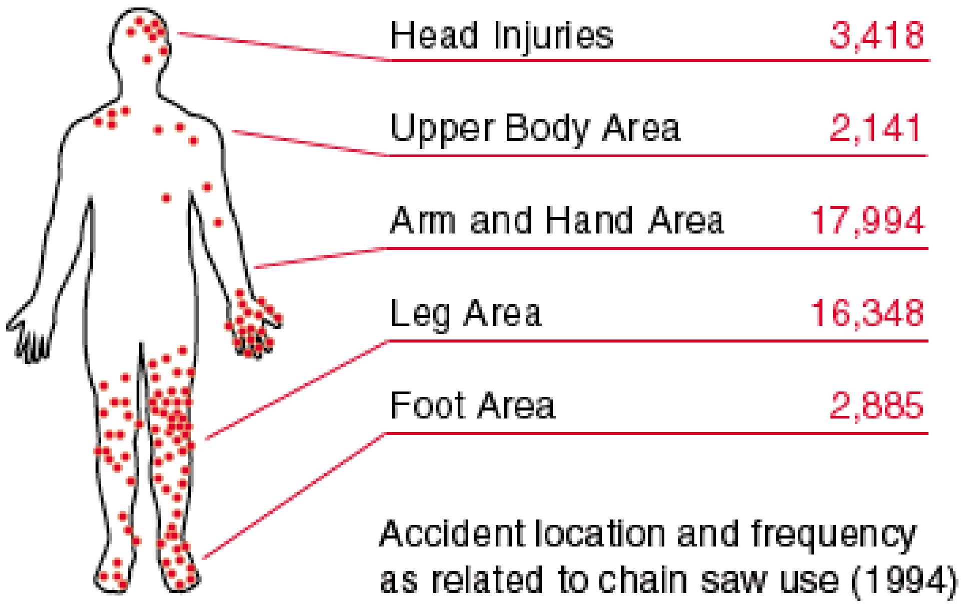
- Employees using chain saws must wear chaps or leg protectors that cover the leg from the upper thigh to mid-calf. The protector must be made of material designed to resist cuts.
- All power chain saws must meet all applicable requirements of the ANSI B175.1-1985, Safety Code for Power Chain Saws.
- Inspect saws daily before use and keep in good repair at all times.
- Do not use saws with cracked or loose handlebars or defective vital parts.
- Stop chain-saw engines while refueling.
- Chain saws must have an operable chain brake if originally designed and equipped with one.
- Chain brakes and other manufacturer’s safety features must be maintained in proper working order.

Guarding

- All portable, power-driven circular saws must have guards.
- Crosscut table saws and rip saws must have hood guards.

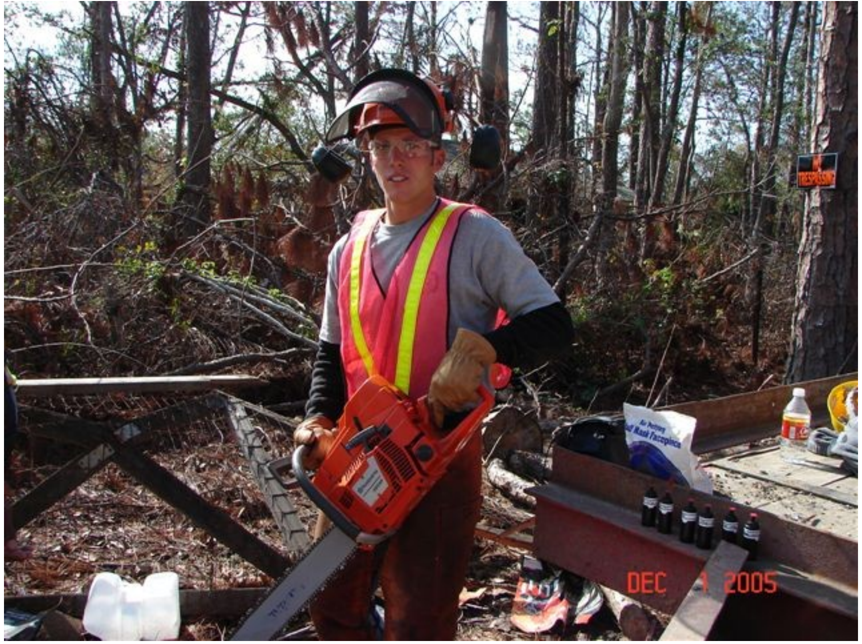
Chain Saw Injury Locations

- **Notice how most injuries occur on the lower left leg and the left arm. Be sure to protect those areas well.**



Accident location and frequency
as related to chain saw use (1994)
U.S. Product Safety Commission

Personal Protective Equipment



- Hard hat
- Safety Glasses
- Face Screen
- Gloves
- Boots
- Chaps
- Hearing Protection
- N-100 Respirator (Demolition)

Safe Work Practices

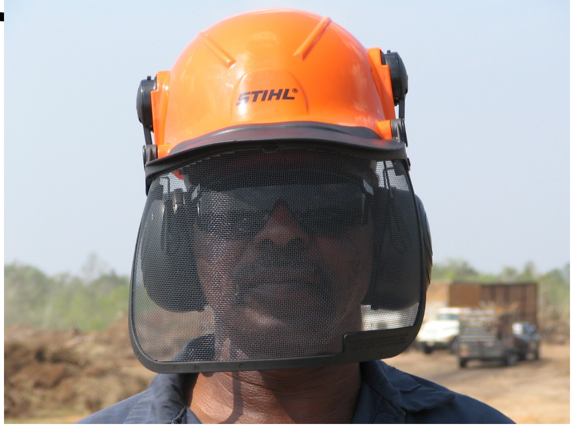
High-Visibility Color

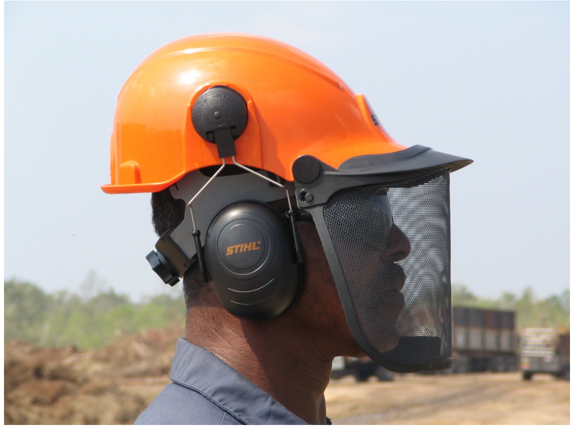
- All employees exposed to the potential hazard of moving lines, falling timber, logs, vehicles, machines and other moving equipment or materials must wear upper body cover and/or hard hats of a high-visibility color, that contrasts with the background color(s).

Personal Protective Equipment

- **Eye and Face Protection.** Where chips, sawdust or flying particles present a hazard, the employer must provide and require personnel to wear eye and face protection meeting the ANSI requirements

NOTE: Logger-type mesh screen may be used for chain saw operators.





Chainsaws Safety

- Chain saws must be inspected before use.
- Chain saws must not be used if they have cracked or loose handle bars or defective vital parts.
- Chain saws must be operated and adjusted in accordance with the manufacturer's instructions.

Chainsaw Safety

- Chain saws must not be fueled with the engine running.
- Chain saws must be fueled at least 10 feet (3 m) from open flames or other source of ignition.
- Chain saws must not be started within 10 feet (3 m) of the fueling area.
- Chain saws must have an operable chain brake, if originally designed and equipped with a chain brake.
- Chain brakes and other manufacturer' safety features must be operational at all times.

GASOLINE
2 GAL 6 OZ 7.81 L

Chainsaw Safety

- Chain saws must be equipped with an automatic throttle control which will return the engine to idling speed upon release of the throttle.
  - **NOTE:** "Idling" is when the chain is not moving while the engine is running.
- Each chain saw must meet all applicable requirements of American National Standard, ANSI B175.1-1991, Safety Requirements for Gasoline-Powered Chain Saws, except where exempt by these rules.
- Chain saws must be started on the ground if they are not otherwise firmly supported.
  - **NOTE:** This does not apply to personnel working aloft in trees when supported by climbing spurs

Chainsaw Safety

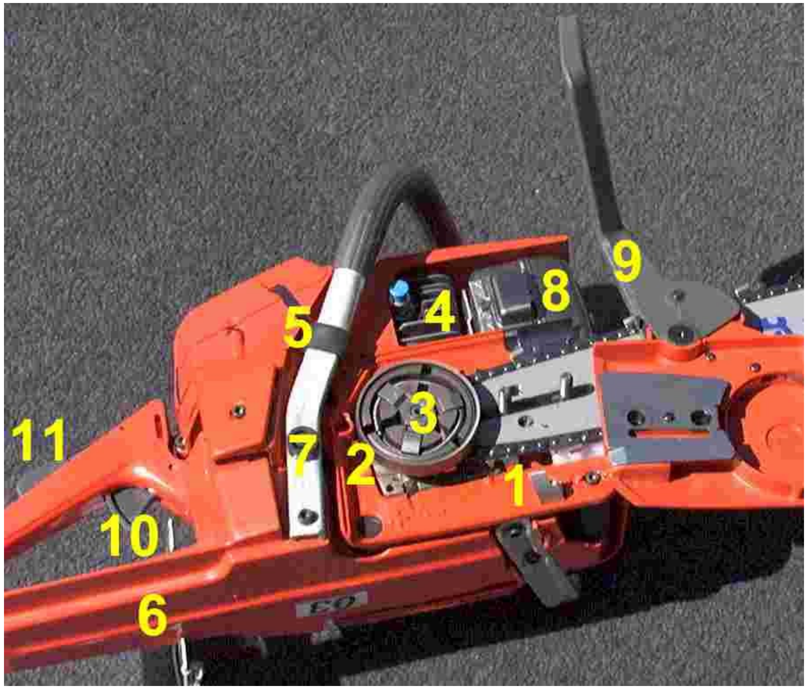
- Chain brakes must be engaged when feasible, while chain saws are being started, unless the manufacturer recommends otherwise.
- Chain saw operators must be certain of footing before starting to cut.
- Chain saws must be held with the thumbs and fingers of both hands encircling the handles during operation unless the employer demonstrates that a greater hazard is posed by keeping both hands on the chain saw in that particular situation.

Chainsaw Safety

- Personnel must not use a chain saw:
  - To cut directly overhead in a manner that would cause limbs, chunks of bark or pieces of wood to fall on the operator.
  - At a distance that would require them to relinquish a safe grip on the saw.
- In a position or at a distance that could cause them to:
  - Become off balance, or
  - Have insecure footing.
- Chain saws must be carried in a manner that will not create a hazard for the operator.
- Where terrain or brush creates a hazardous condition, the chain saw engine must be shut off while the operator is walking.
- The chain saw must be shut down or the chain brake must be engaged whenever a saw is carried farther than 50 feet.

Parts of a Chain Saw

1. **Chain catcher** to prevent a broken or dislodged chain from striking the logger.
2. **Flywheel**
3. **Clutch**
4. **Decompression valve**
5. **Anti-vibration handle system** is recommended by OSHA to limit ergonomic stress to the logger's joints.
6. **Hand guard**
7. **Anti-vibration handle system** is recommended by OSHA to limit ergonomic stress to the logger's joints.
8. **Muffler** to reduce engine noise.
9. **Chain brake** to stop the chain if kickback occurs, if the saw was placed into service after February 9, 1995.
10. **Throttle** which will stop the chain when pressure on the throttle is released.
11. **Throttle interlock** which prevents the throttle from activating until the interlock is depressed.



Safe Operation of a Chain Saw

Before Starting the Saw

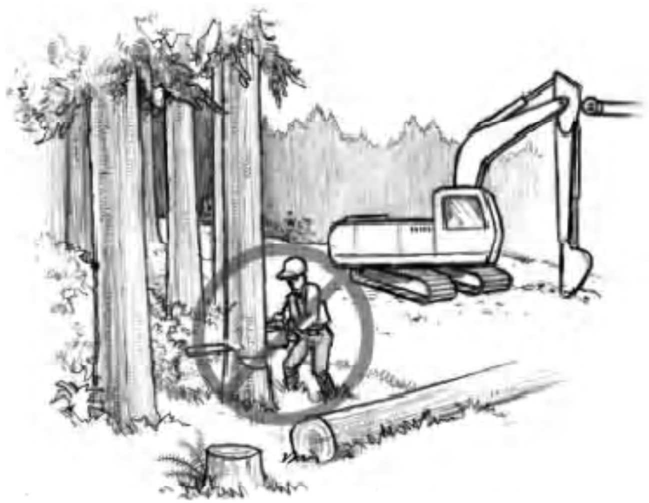
- Check controls, chain tension, and all bolts and handles to ensure they are functioning properly and adjusted according to the manufacturer's instructions.
- Fuel the saw at least 10 feet from sources of ignition.
- Start the saw at least 10 feet from fueling area, with chain brake engaged, and with the chainsaw on the ground or otherwise firmly supported.
- Check the fuel container for the following requirements:
  - Must be metal or plastic
  - Must not exceed a 5 gallon capacity
  - Must be approved by the Underwriters Laboratory, Factory Mutual (FM), the Department of Transportation (DOT), or other Nationally Recognized Testing Laboratory.

Safe Operation of a Chain Saw

While Running the Saw

- Keep hands on the handles, and maintain secure footing while operating the chainsaw.
- Clear the area of obstacles that might interfere with cutting the tree or using the retreat path.
- Do not cut directly overhead.
- Shut off or throttle released prior to retreating.
- Shut off or the chain brake engaged whenever the saw is carried more than 50 feet, or on hazardous terrain.

Tree Falling

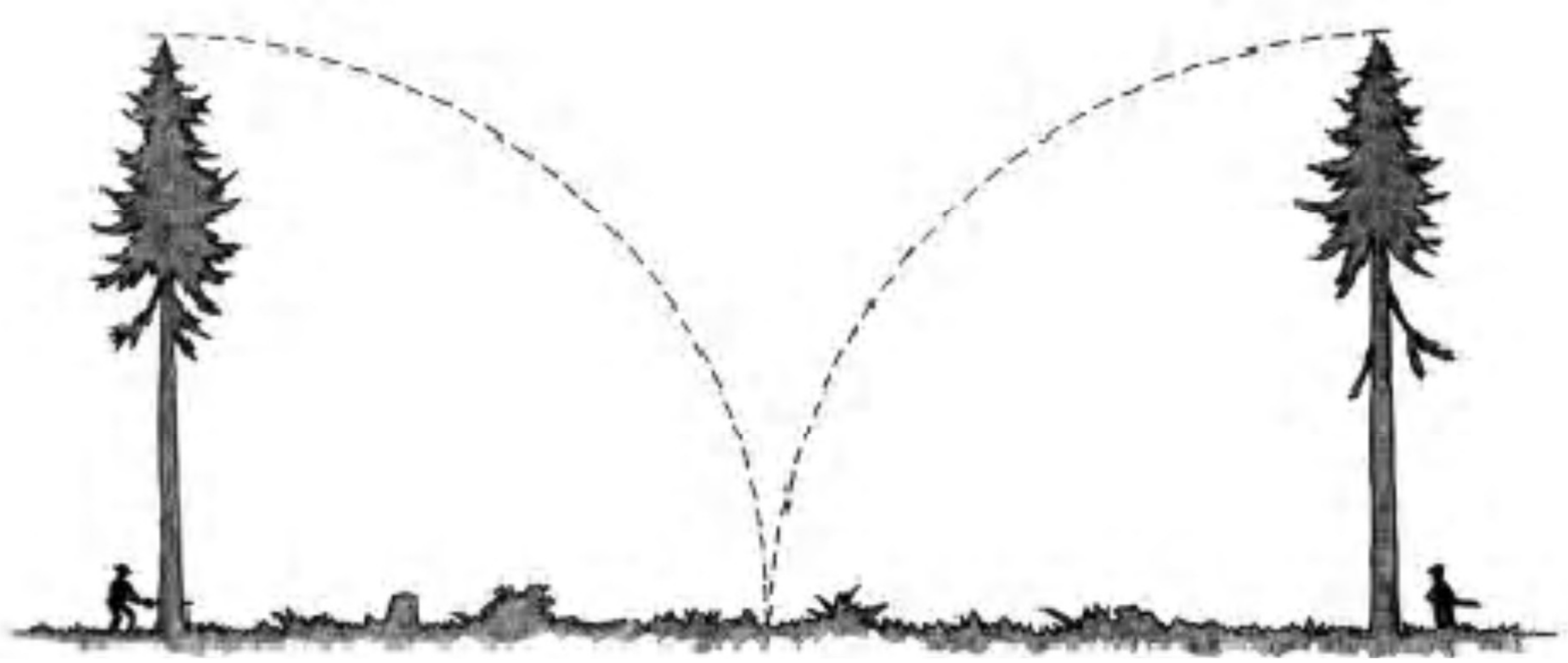


General Requirements.

- Any worker falling a tree or bucking a log must be located so their work will not endanger others.
- Personnel must not approach within two tree lengths of a tree being felled without receiving a signal from the person falling the tree that it is safe to approach.
- The minimum distance between any worker(s) manually falling trees and any other personnel must be twice the height of the trees being felled.

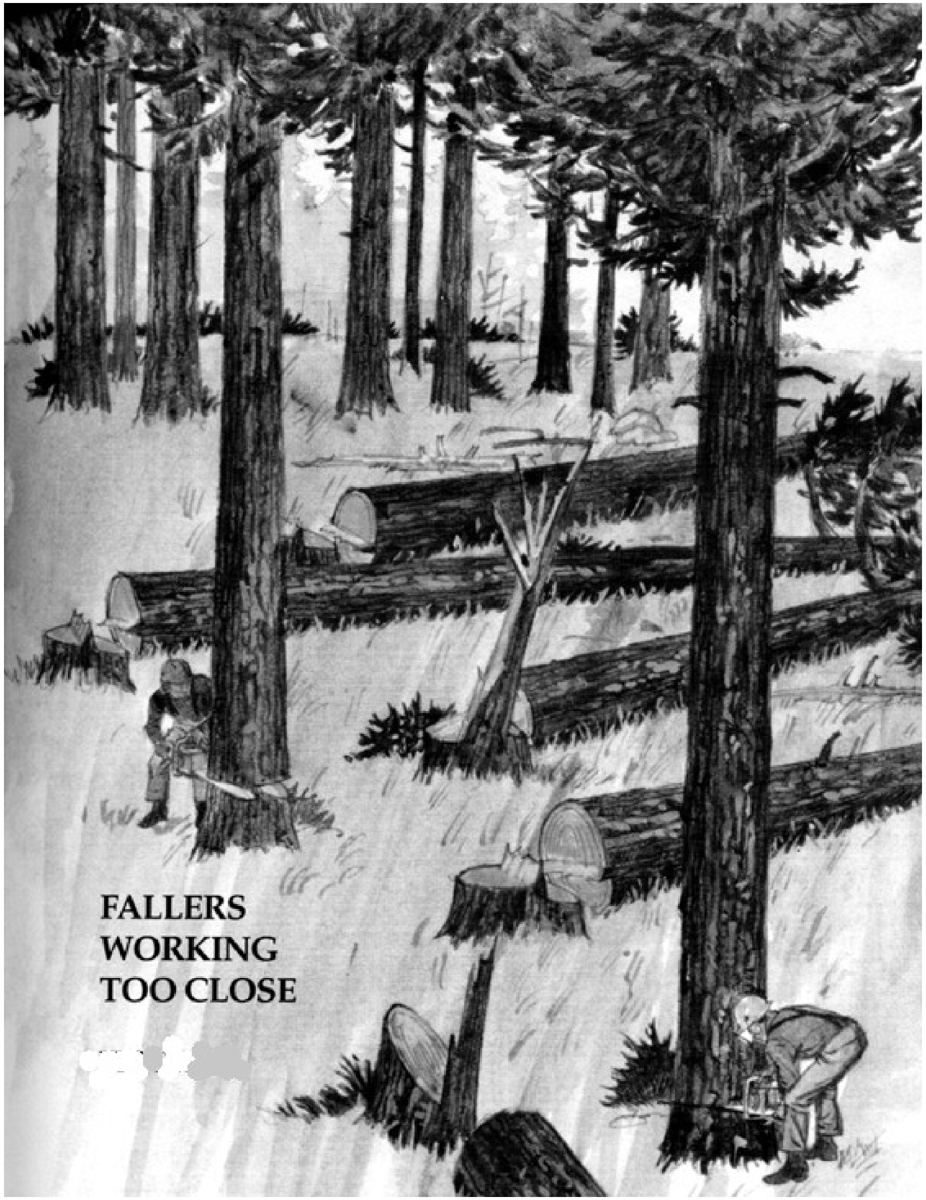
EXCEPTION: This does not apply to a team of two or more working on the same tree

Maintain safe working distance



Communications

- Workers who are single jacking must be positioned so they are close enough to render assistance to each other in case of an emergency. They must be:
  - Within sight of each other, or
  - Able to talk to each other by natural unassisted voice communication.



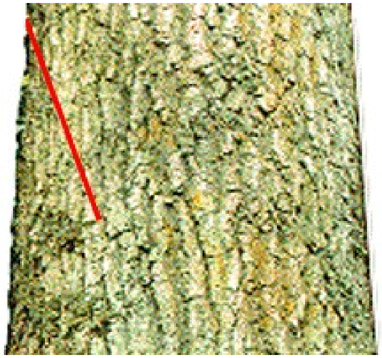
Danger Trees

- An example of unstable Wind Blown danger trees.
- Use mechanical equipment to remove if possible.

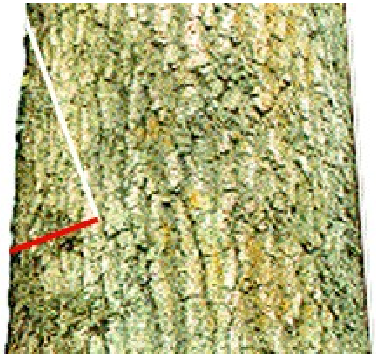
Manual Falling

- Falling cuts must not be made in a standing tree while anybody is in the area where the tree could fall.
- Trees must not be felled if the wind is strong enough to prevent the tree from falling in the desired direction.
- Domino falling is prohibited.
  - **EXCEPTION:** A lodged tree can be dislodged by falling another tree into it.
- A worker must not:
  - Work under a lodged tree.
  - Cut a tree that another tree is lodged in.
- When any lodged or standing tree with undercuts or back cuts is left unattended, the hazardous area must be distinctly marked by hazard identification ribbon
- Only qualified workers may fall danger trees.

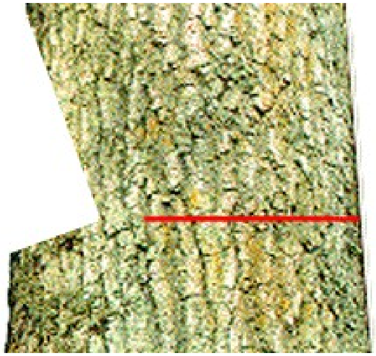
Making the Cuts



1. **Top Cut**



2. **Bottom or Undercut**

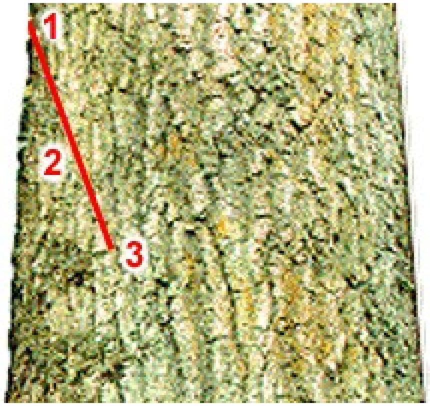


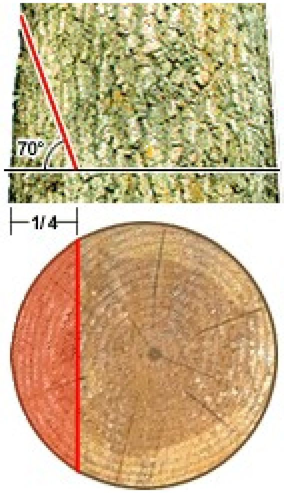
3. **Back Cut**

The Open-faced Top Cut

The Correct Cut

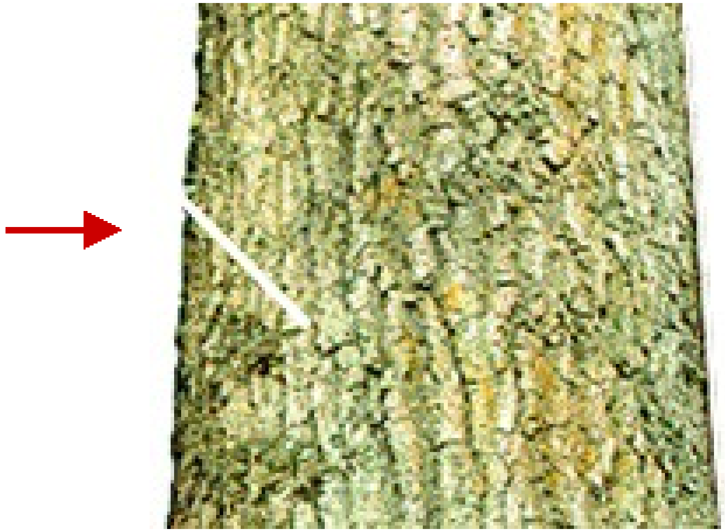
1. **Starting Point**
   Important -- begin at any height as long as you allow enough room for the undercut
2. **Angle of Attack**
   Important -- cut downward at an angle of 70 degrees
3. **Ending Point**
   Stop when the cut reaches 1/4 to 1/3 of the trunk's diameter or when the cut reaches 80% of the tree's diameter at breast height



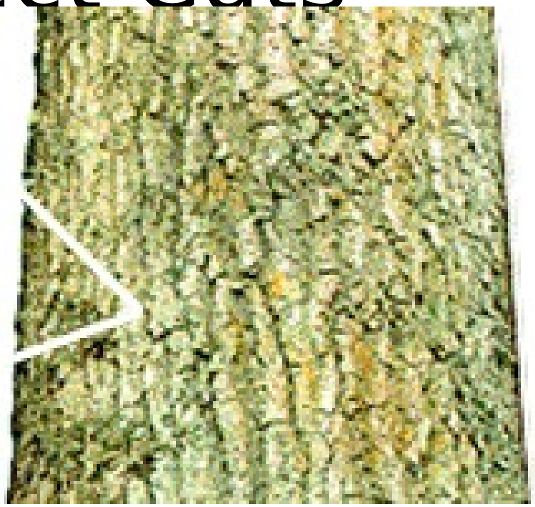


The Open-faced Top Cut

Common Incorrect Cuts



Here the top cut is not steep enough resulting in a notch of less than 45 degrees.

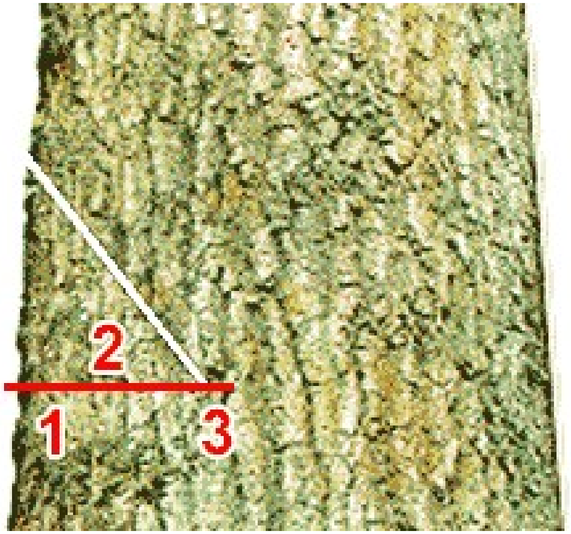


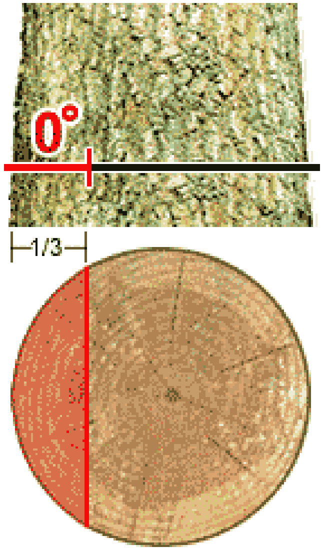
Here the bottom cut is not steep enough, resulting in a notch of less than 45 degrees.

The Conventional Bottom or Undercut

The Correct Cut

1. **Starting Point**
   Cut horizontally from the bottom of the top cut.
2. **Angle of Attack**
   Important — cut horizontally with no angle.
3. **Ending Point**
   Very important — stop when the cut reaches the end point of the top cut. Ideally, you have created a 45 degree notch opening.

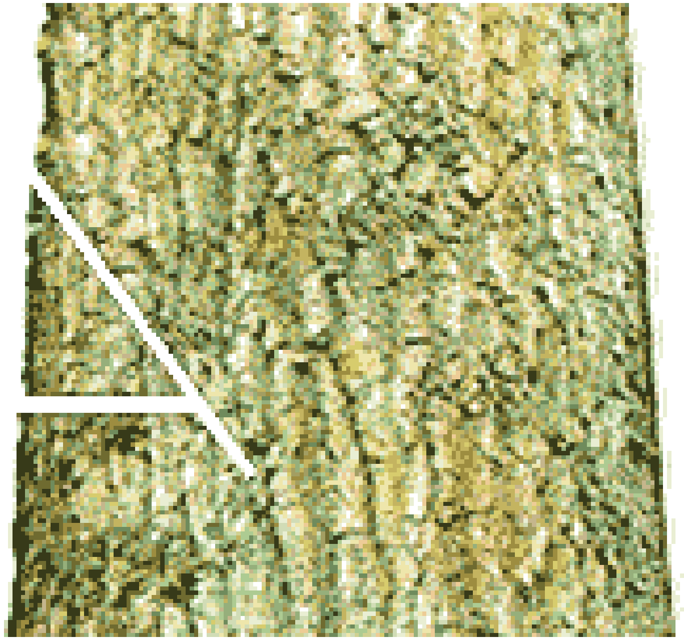




The Conventional Bottom or Undercut

A Common Incorrect Cut

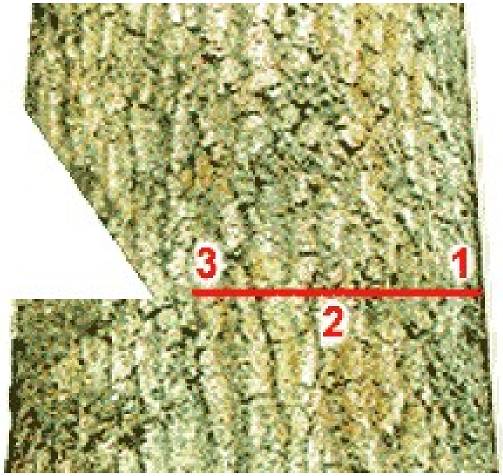
Here the ending point of the under cut doesn't meet the endpoint of the first cut . . .. . . resulting in a Dutchman notch.

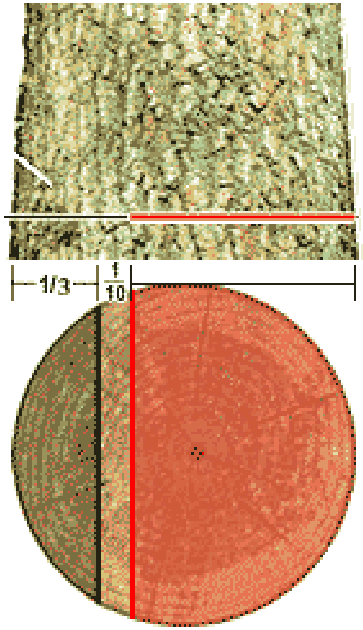


The Conventional Back Cut

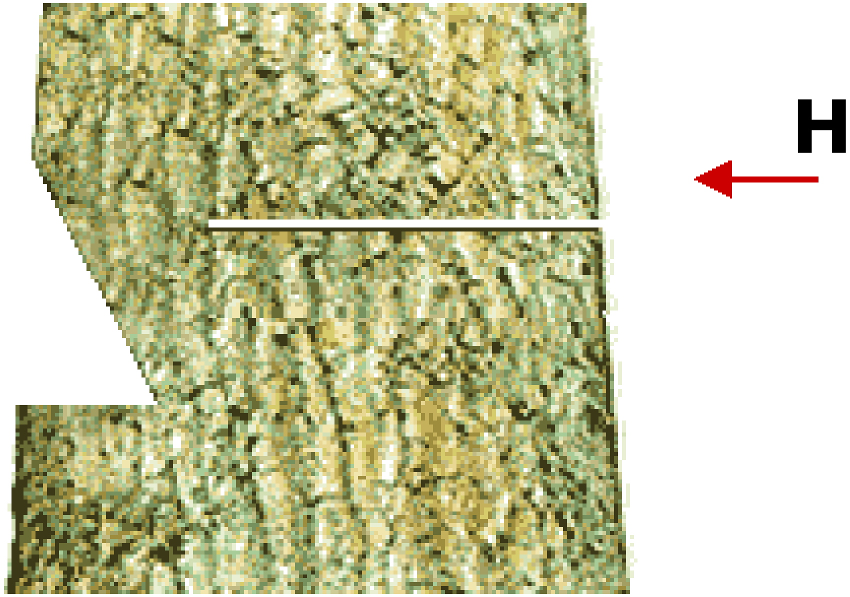
The Correct Cut

1. **Starting Point**
   Important - begin on the opposite side of the notch one inch above the notched corner.
2. **Angle of Attack**
   Important - cut flat along a horizontal plane
3. **Ending Point**
   Very important - stop at the point that will leave a hinge width that is 1/10 the tree's diameter   This is the simplest of all back cuts. Other back-cutting techniques may be required for felling difficult trees.





The Conventional Back Cut



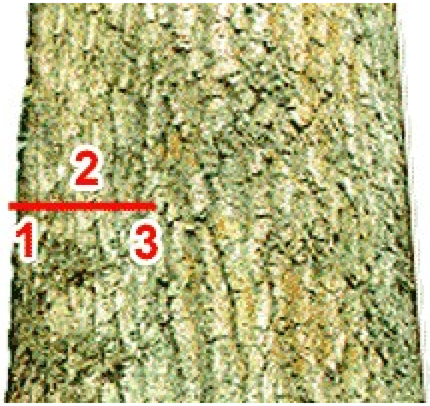
A Common Incorrect Cut.

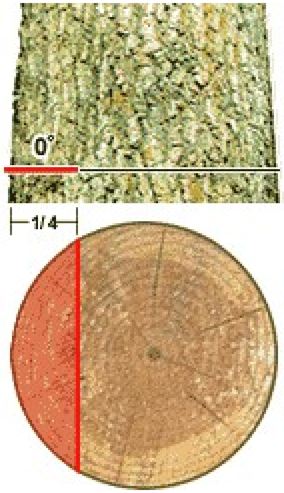
Here the starting point of the back cut is higher than the notched corner . . . . . . resulting in a poor hinge.

The Humbolt Top Cut

The Correct Cut

1. **Starting Point**
   Important -- begin at any height as long as you allow enough room for the undercut
2. **Angle of Attack**
   Important -- cut flat and horizontally
3. **Ending Point**
   Stop when the cut reaches 1/4 to 1/3 of the trunk's diameter or when the cut reaches 80% of the tree's diameter at breast height

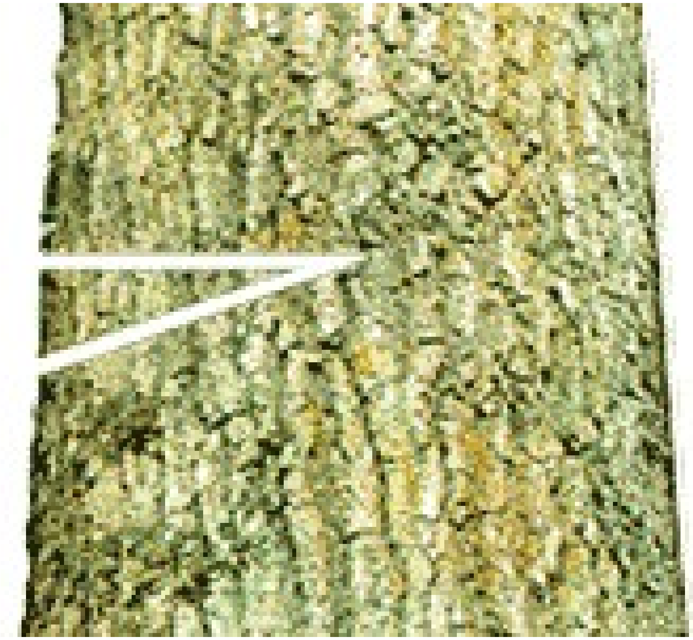




The Humbolt Top Cut

Common Incorrect Cuts

Here the bottom cut is not steep enough, resulting in a notch of less than 45 degrees.



	Open-faced Notch	Conventional Notch	Humbolt Notch
Total angle	ideally 90 degrees; at least 70 degrees	45 degrees	45 degrees
Top Cut	angled downward 70 degrees	angled downward 45 degrees	flat horizontal
Bottom Cut	angled upward 20 degrees	flat horizontal	angled upward 45 degrees
Back Cut	horizontal; at the same height as the corner of the notch	horizontal; at least 1 inch above the bottom cut	horizontal; at least 1 inch above the top cut
Depth	1/4 - 1/3 of tree diameter	1/4 - 1/3 of tree diameter	1/4 - 1/3 of tree diameter
Point of notch closure	just before tree hits ground	middle of fall	middle of fall
Degree of safety	high	medium	medium
Advantages	greater accuracy of felling into target area hinge stays intact until tree hits ground less danger of kickback and other out-of-control movement	familiar to many loggers	saves slightly more wood familiar to many loggers
Disadvantages	hinge may have to be cut off	hinge breaks early	hinge breaks early

Limbing and Bucking

- Limbing is cutting branches off of felled or standing trees. Bucking is sawing felled trees into sections called logs. The length of the logs is dependent on the species of the tree and type of final product.
- Primary hazards include unstable logs, and hazards associated with using chain saws.
- Examples of proper bucking to relieve tension for top bind and bottom bind are provided below.

Limbing and Bucking

Prior to limbing, loggers should evaluate five potential hazards as follows:

- Overhead hazards.
- Spring poles.
- Butt movement forward (creates back pressure on limbs).
- Butt twist (creates sideways pressure on limbs).
- Butt off the ground (creates tension and compression on the tree stem).

Highlights of Limbing and Bucking Requirements

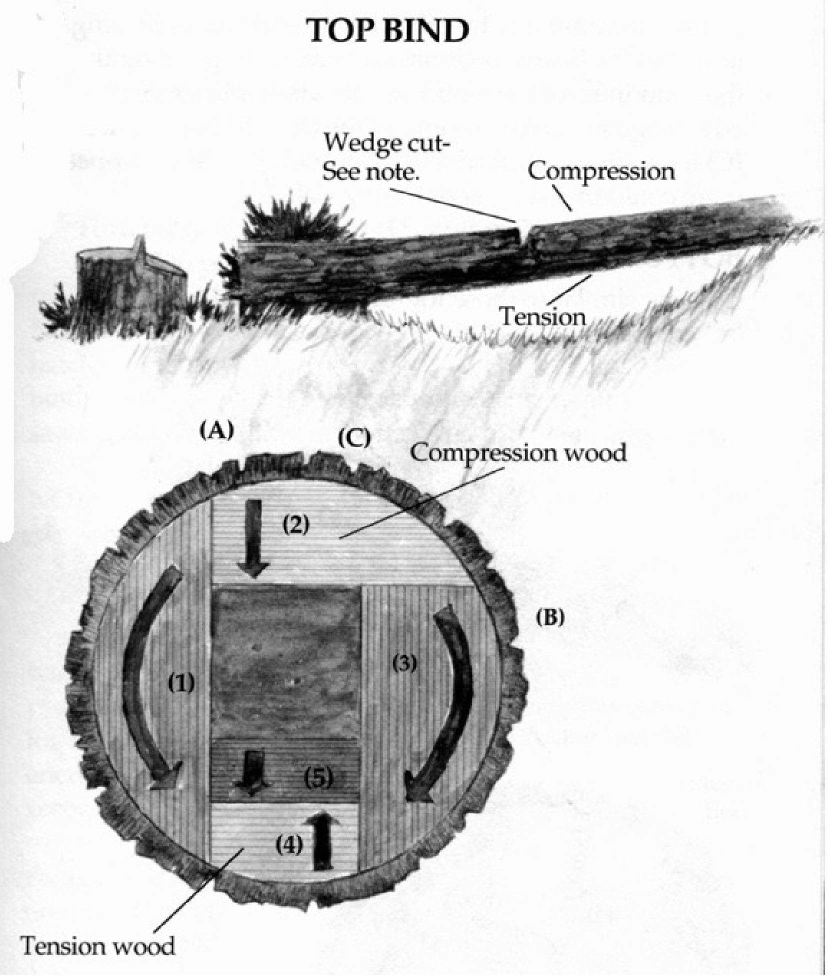
- Limbing and Bucking must be done on the uphill side of each tree or log, where rolling or sliding of logs may be expected.
- Precautions, such as moving to a stable position, must be taken to prevent the logs or the butt from striking employees while limbing and bucking trees.

Limbing and Bucking

Top Bind

Arrows indicate saw travel direction and cross-hatching indicates the heartwood that will break. Depending upon the soundness of the wood and the timber lie, it may be advantageous to use the end of the bar and bore from point (C) in making cuts number (1) and number (3) if it appears there could be a danger of the log slabbing.

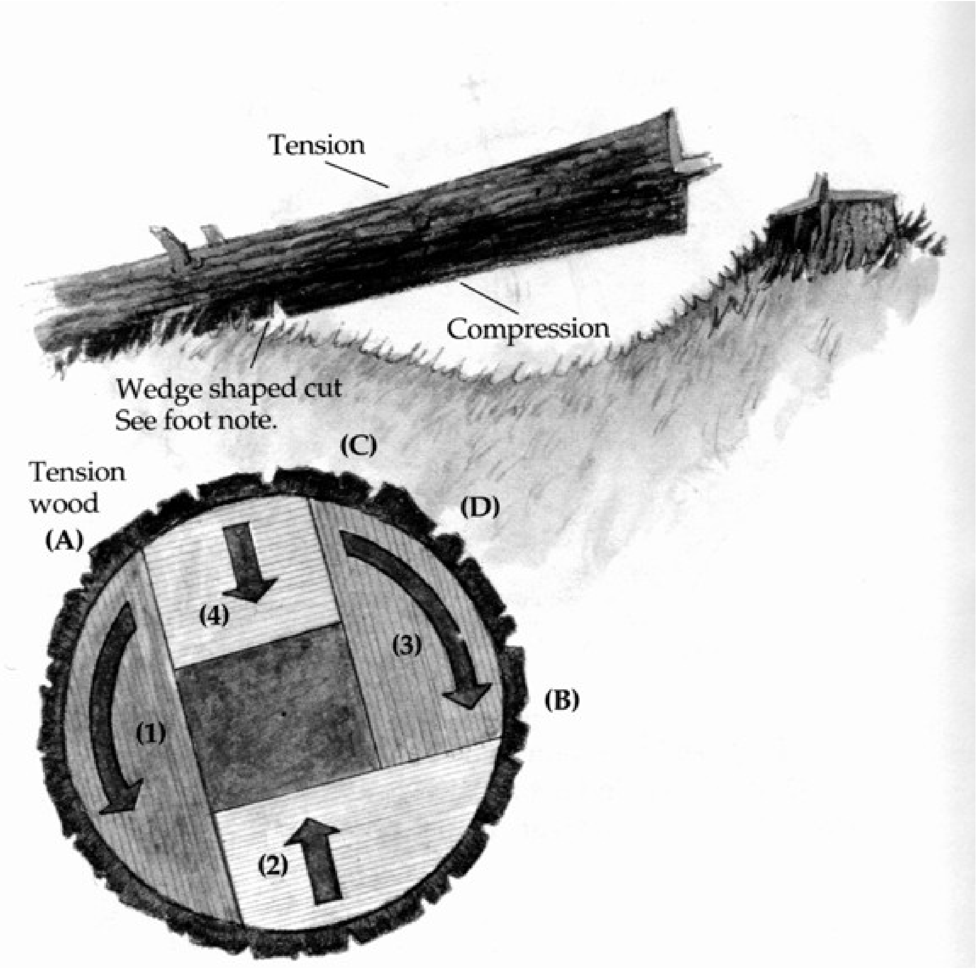
NOTE: A wedge section could be removed when sawing cut (2) if the top bind is excessive, to allow the tree cut to close as cuts (4) and (5) are made.


TOP BIND
Wedge cut-
See note.
Compression
Tension
(A)
(C)
Compression wood
(2)
(B)
(1)
(3)
(5)
(4)
Tension wood

Limbing and Bucking

Bottom Bind

Cuts are similar t those for top bin except top and bottom cuts are reversed.


Tension
Compression
Wedge shaped cut
See foot note.
Tension
wood
(A)
(C)
(D)
(B)
(4)
(3)
(1)
(2)

Manual Falling

- When falling danger trees:
  - Use extra caution.
  - Remove loose bark within reach from the ground before starting to fall the tree.
- Use a deep undercut with a wide face opening, and fall the danger tree in the direction of lean whenever possible to avoid vibration caused by wedging.
- One worker must not fall a tree or danger tree when the assistance of another worker is necessary to minimize the risk of injury caused by overhead hazards, loose bark, loose or interlocked limbs, conditions of the tree, terrain or cutting conditions.
- An escape route must be determined and arranged before a tree is fallen so the worker(s) falling the tree can move at least 25 feet away from and to the side of the base of the tree.

Manual Falling

- The escape route must be clear of brush, snow, tools and other material that would impede a quick escape.
- Workers must not remain at the stump as the tree falls unless it is necessary to complete the backcut. Once the backcut is completed, the worker must immediately release the throttle and move a safe distance away from the tree.
- Trees must be felled into the open whenever practical.
- When manual falling or tree jacking, trees must not be felled directly uphill when the probability of the tree sliding back past the stump is likely.
- When manual falling or tree jacking, trees felled uphill must be quartered to the slope, to minimize exposure to sliding or rolling trees.

Manual Falling

- When trees or snags are over 6 inches DBH:
  - Undercuts must not be less than 1/4 the diameter of the tree.
  - Face openings must not be less than 1/5 the diameter of the tree.
- Undercuts must be completely removed and cleaned out unless it is necessary to use a Dutchman on either side of the cut.
- Undercuts and back cuts must be made at a sufficient height above the highest ground level to enable the person falling the tree to:
  - Safely make the cut.
  - Control the tree.
  - Have freedom of movement for a quick escape.
- Back cuts must be made above and on a horizontal plane with the face cut.
- Holding wood must not be completely cut through.

NOTE: When completing a swing cut, sufficient holding wood must be maintained to guide the tree during most of its fall.

Manual Falling

EXAMPLE: Acceptable undercuts:

- **A. Conventional undercut.** Can be made with parallel saw cut and axe diagonal cut or both cuts with the saw. Generally used on trees of small diameter.

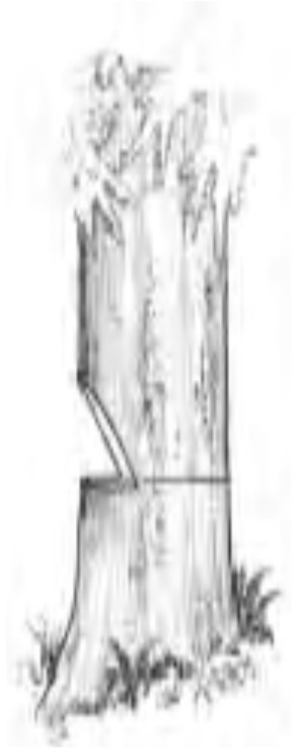


Figure 7-35 – Falling – Conventional Face

Manual Falling

B. Humbolt cut. Both cuts made with the saw. Same as "A" except that waste is put on the stump.

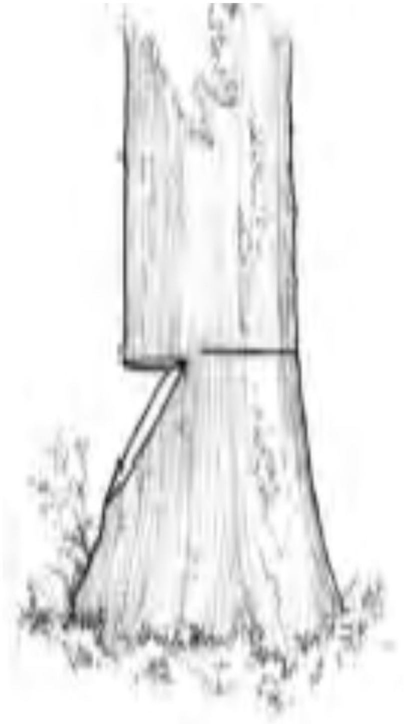


Figure 7-36 – Falling – Humbolt Face

Manual Falling

C. Open face cut. Both cuts made with the saw. The top and bottom face cuts generally form a 90 degree angle when completed. Works best on small diameter trees.

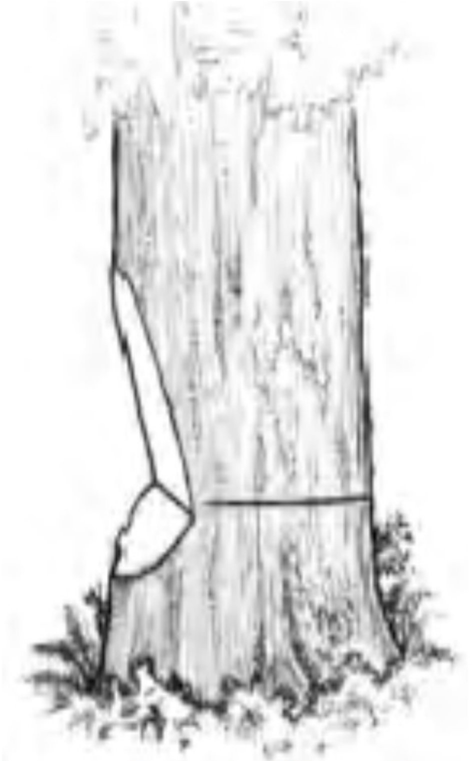
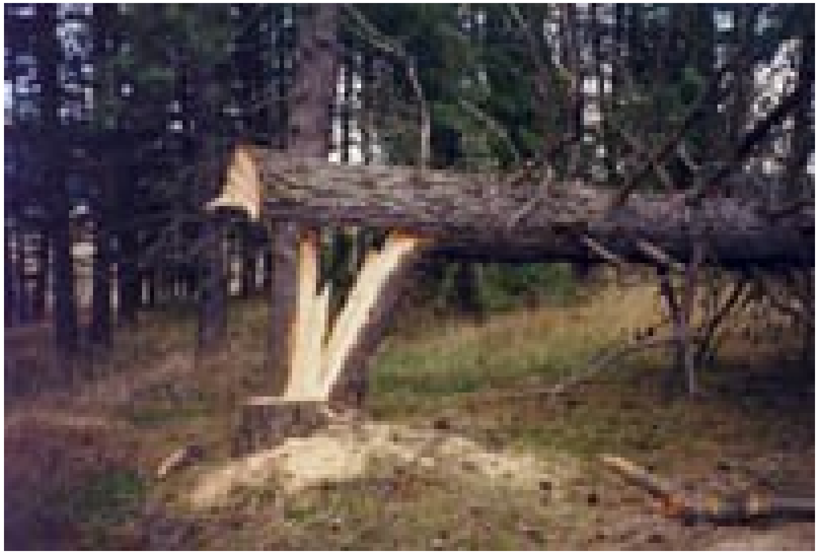


Figure 7-37 – Falling – Open Face

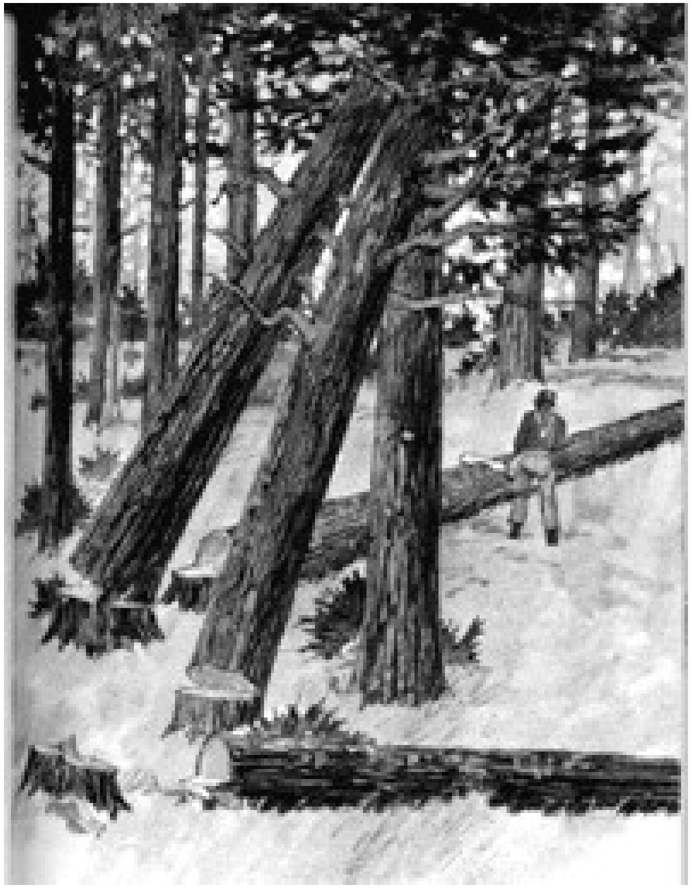
Dangerous Results of Incorrect Felling

Barber Chair

- The splitting of the butt of the log during the latter part of the fall. The tree often remains attached to the stump, thus creating a danger zone and ruining much of the log.
- Caused by a Dutchman notch.



Dangerous Results of Incorrect Felling



Lodged Tree (also called **A Hung Tree)**

- A cut tree that has not fallen completely to the ground, but is lodged or leaning against another tree. This is extremely dangerous.
- Do NOT work in the presence of hung trees. Have these death-traps pushed or pulled down by a machine.
- Caused by poor judgment of felling path or inaccurate cutting.

Dangerous Results of Incorrect Felling

Kickback

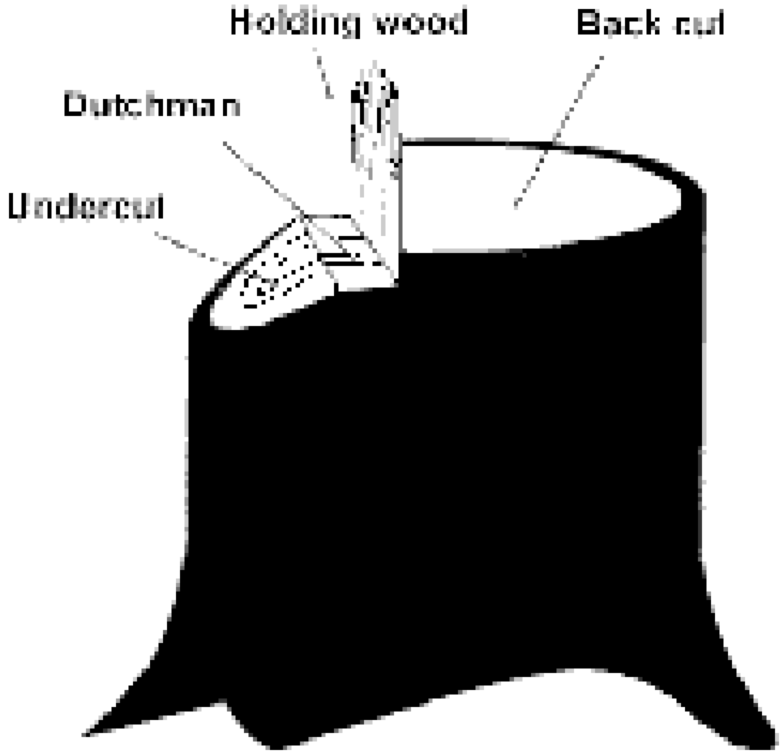
- When a falling tree hits the ground or other object it can bounce back causing the log to move back over the stump with great force. This is the main reason you should never stand or retreat directly behind the tree.
- Increased chance of kickback by not making the back cut above the notch on a conventional or Humbolt notch.

Dangerous Results of Incorrect Felling

Throwback

- Limbs or other material thrown back toward the logger when the falling tree contacts standing trees or fallen trees.
- Caused by not felling the tree in a clear path or onto a clear landing.

Dangerous Results of Incorrect Felling

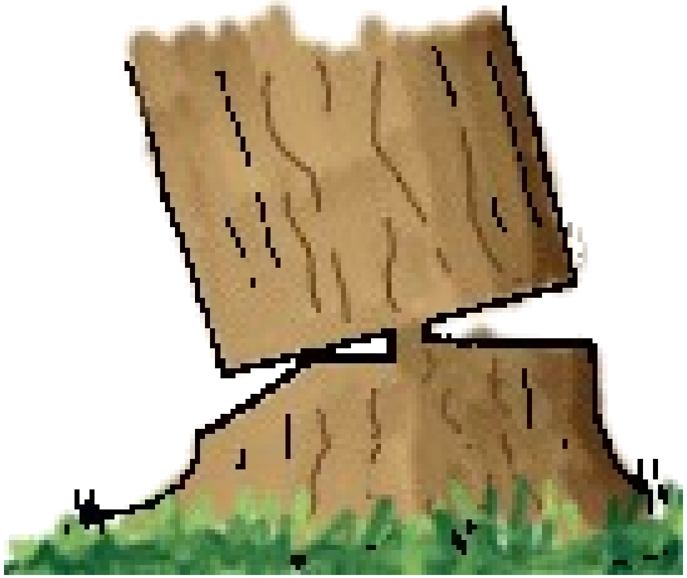

Holding wood
Back cut
Dutchman
Undercut

Dutchman

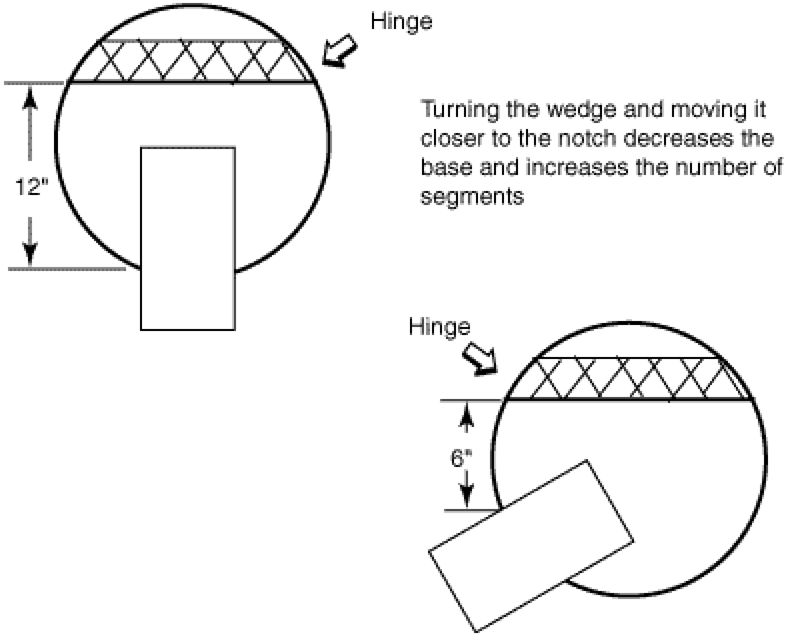
- The seat that interferes with the smooth closing of the notch
- Caused when one of the notch cuts is made too deep and extends beyond the endpoint of the other notch cut, known as "Bypass"

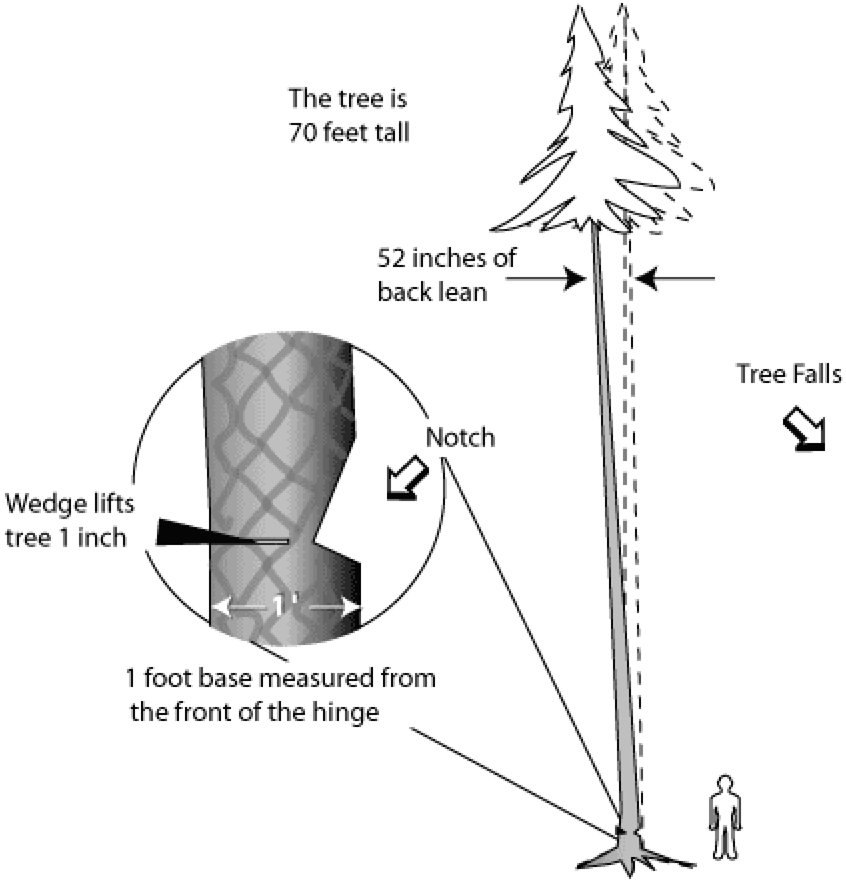
Stalled Tree

- A tree that has just begun to fall but is stopped by its own stump. This is almost as dangerous as a lodged tree and requires a machine to push it over.
- Caused by a Dutchman notch.



Wedges

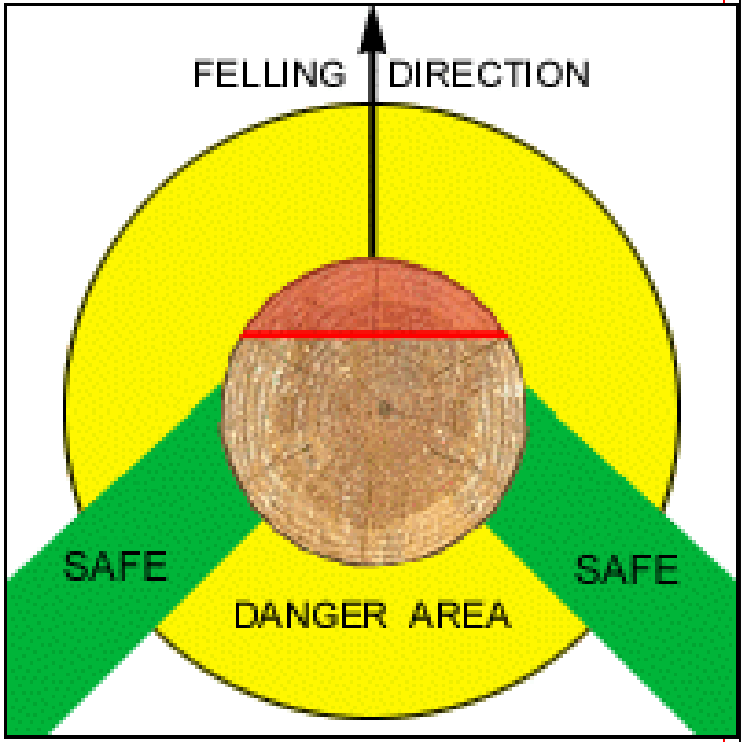

Hinge
12"
Turning the wedge and moving it closer to the notch decreases the base and increases the number of segments
Hinge
6"


The tree is
70 feet tall
52 inches of
back lean
Tree Falls
Notch
Wedge lifts
tree 1 inch
1'
1 foot base measured from
the front of the hinge

Retreat Path

You must plan your escape route and clear a path BEFORE you begin cutting.

- **Direction of Safe Retreat**
- **45 degrees from the sides and back on either side**
- **NEVER move away directly behind the tree- you can be seriously hurt if the tree butt kicks back during the fall**


FELLING
DIRECTION
SAFE
SAFE
DANGER AREA

Retreat Path

How to Retreat

- **Using a bore cut and a release cut will make it easier to retreat in plenty of time**
- **Don't turn back on the falling tree**
- **Walk quickly away to a distance of 20 feet from the falling tree**
- **Position yourself behind a standing tree if possible**

Bobcats/Skid Loaders

- The employer must ensure that each powered industrial truck operator is competent.
- Training must include a combination of formal instruction, practical training, and evaluation.
- Operators’ performance must be evaluated at least once every three years.
- Employers must certify each operator’s training.
- Certification must include name of the operator, the date of the training, the date of the evaluation, and the identity of the trainer/evaluator.
- At the beginning of each shift, operators must check all vehicles’ service brakes, including trailer brake connections, parking systems (hand brakes), emergency stopping systems (brakes), tires, horns, steering mechanisms, coupling devices, seat belts, operating controls, and safety devices.
- You cannot use spinner knobs on the steering wheel unless the truck has a steering mechanism that prevents road reaction from transmitting to the steering wheel.
- There can be no riders on lift trucks or other powered industrial trucks.
- Raising people with a lift truck or loader requires a special platform that has standard guardrails and a guard to prevent worker contact with the lifting mechanism.

Safe Work Practices

- **Electric tools**
  - All portable electric hand tools must have a three-wire cord with the ground wire permanently connected to the tool frame and means for grounding the other end or be double insulated.
  - All portable electric hand tools must have ground fault circuit- interrupter protection.

Safe Work Practices

- **Traffic control**
  - Employers must control pedestrian and vehicular traffic at all job sites on or adjacent to highways, streets or railways. Traffic controls must conform to:
    - the American National Standards Institute (ANSI) D6.1e-1989,
    - Manual on Uniform Traffic Control Devices for Streets and Highways.
    - OSHA Subpart G
    - USACE EM 385-1-1

Various work equipment & trucks have “blind spots” to the work crew – Be aware of……

The NO-ZONE

THE SHADED AREA SURROUNDING EACH VEHICLE REPRESENTS THE DANGER ZONE or “NO-ZONE” IN WHICH THE VEHICLE OPERATOR’S VIEW OF PEDESTRAN TRAFFIC IS GREATLY REDUCED OR OBSCURRED ALTOGETHER.

Mechanical Removal

- Use mechanized equipment in danger areas.

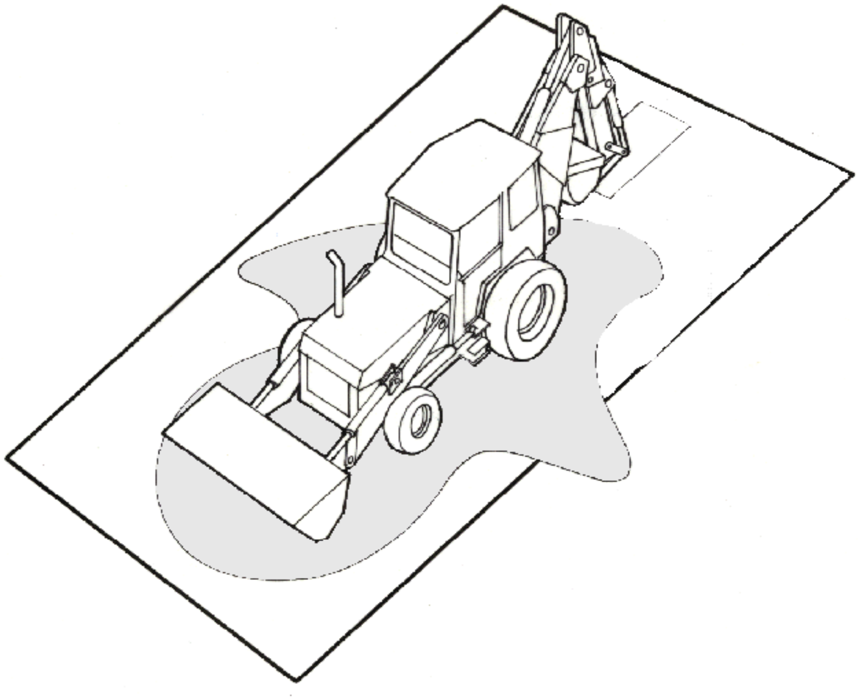
DEC 1 2005

Mechanical Removal

- Beware of overhead dangers
- Mark off danger areas

CAT
287B
DEC 1 2005

Operator sight distances from eye level to ground


S-25 BACKHOE

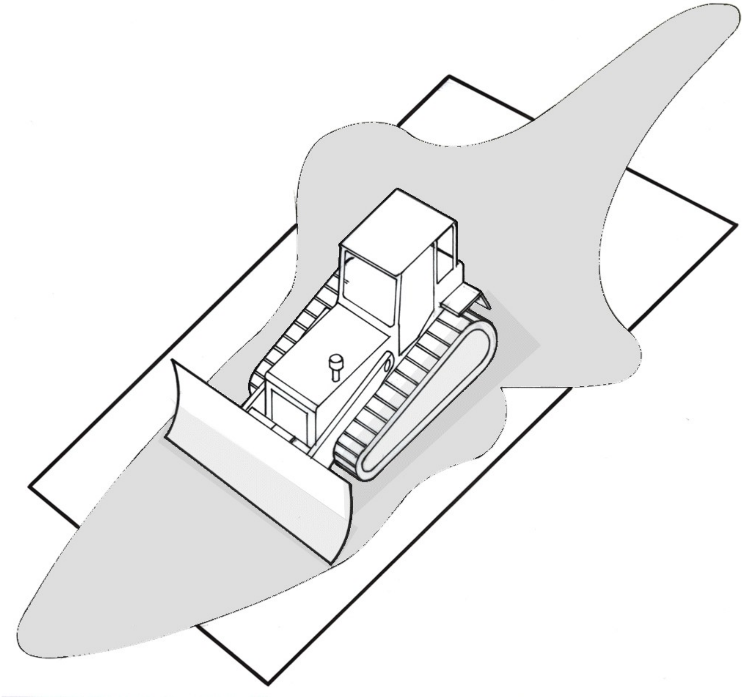
310 D
JOHN DEERE
TURBO 4X4
310 D
DEERE

Vehicle:

Rubber Tire Backhoe

Mechanical Removal

CAT
MS0817
DEC 1 2005

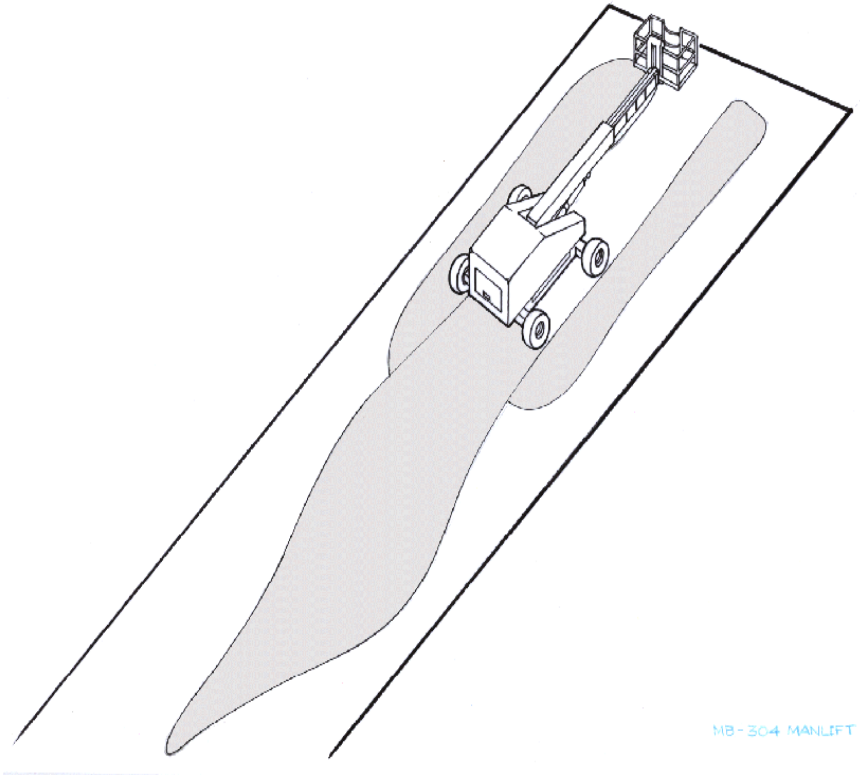


744H
DEERE
WL 345-A

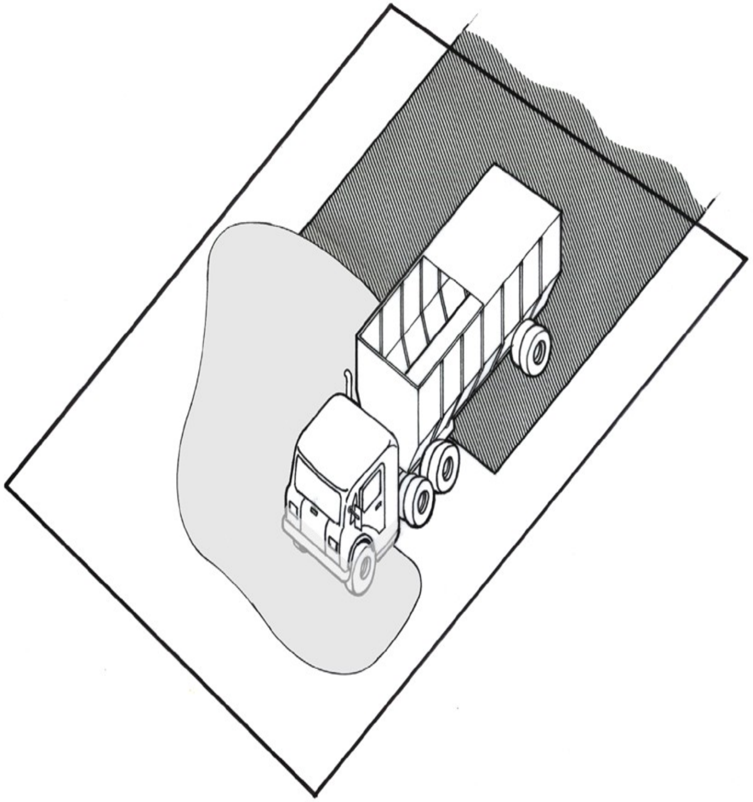
Vehicle:

Bulldozer

Operator sight distances from eye level to ground


MB-304 MANLIFT

Vehicle: Man lift



Vehicle: Refuse Truck

Earthmoving equipment

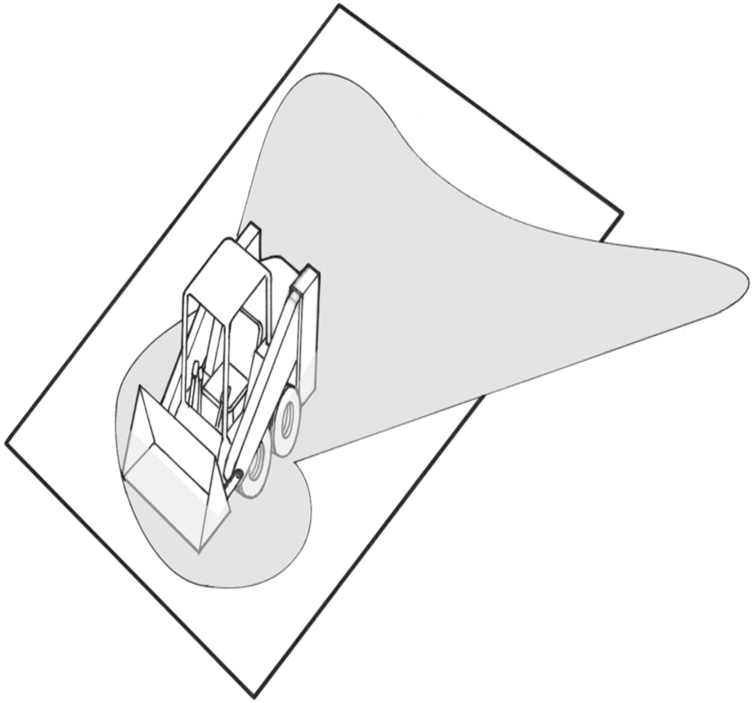
- All earthmoving equipment with roll-over protective structures must have seat belts, except that in which the driver stands.
- Equipment with an obstructed view to the rear must have a working back-up alarm that is distinguishable from surrounding noise.

CATERPILLAR

US Army Corps of Engineers ®

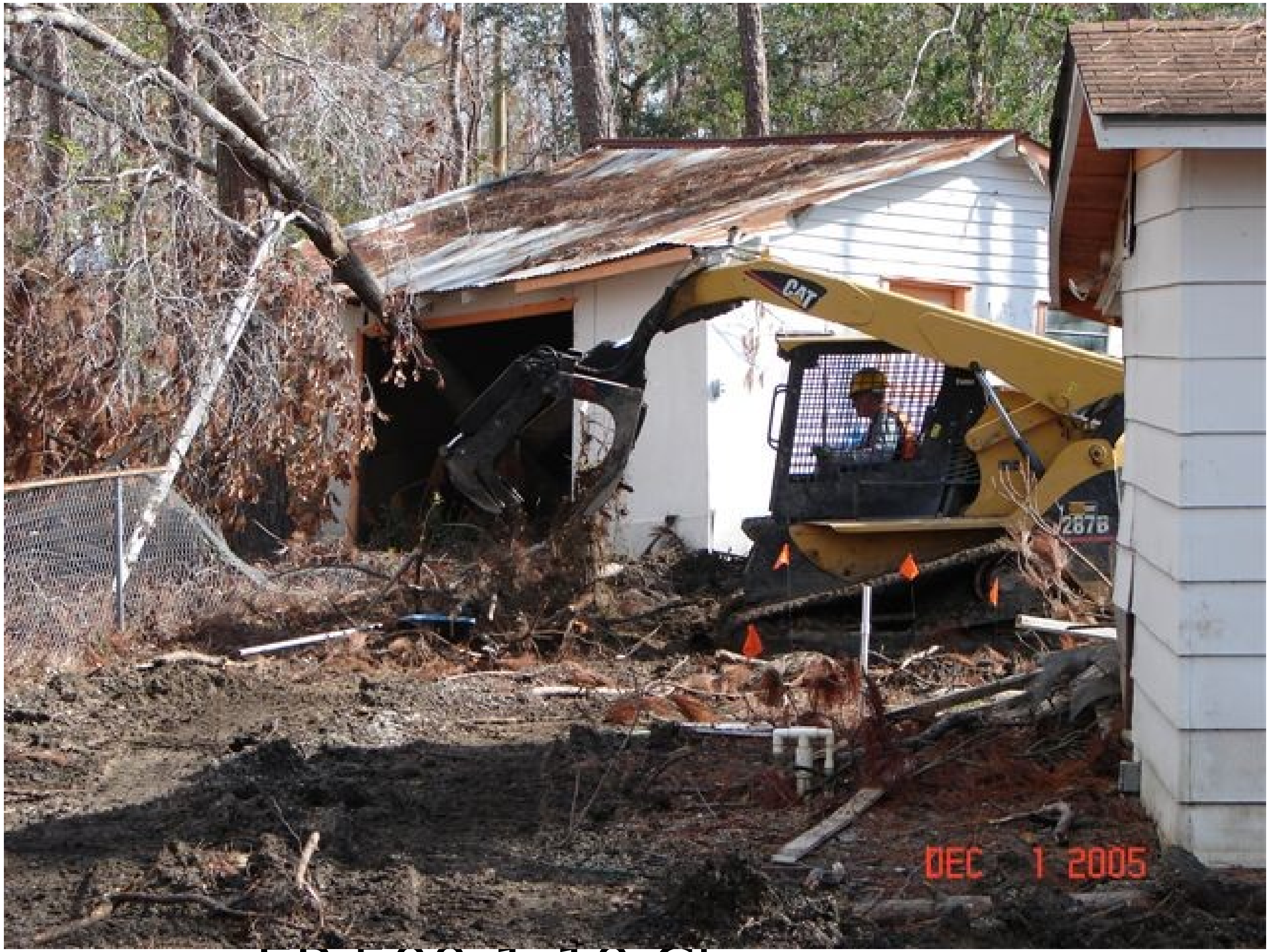
Mechanical Removal

MACK
MS08762
DEC 1 2005



Vehicle: Bobcat/Skid Steer

Mechanical Removal


CAT
287B
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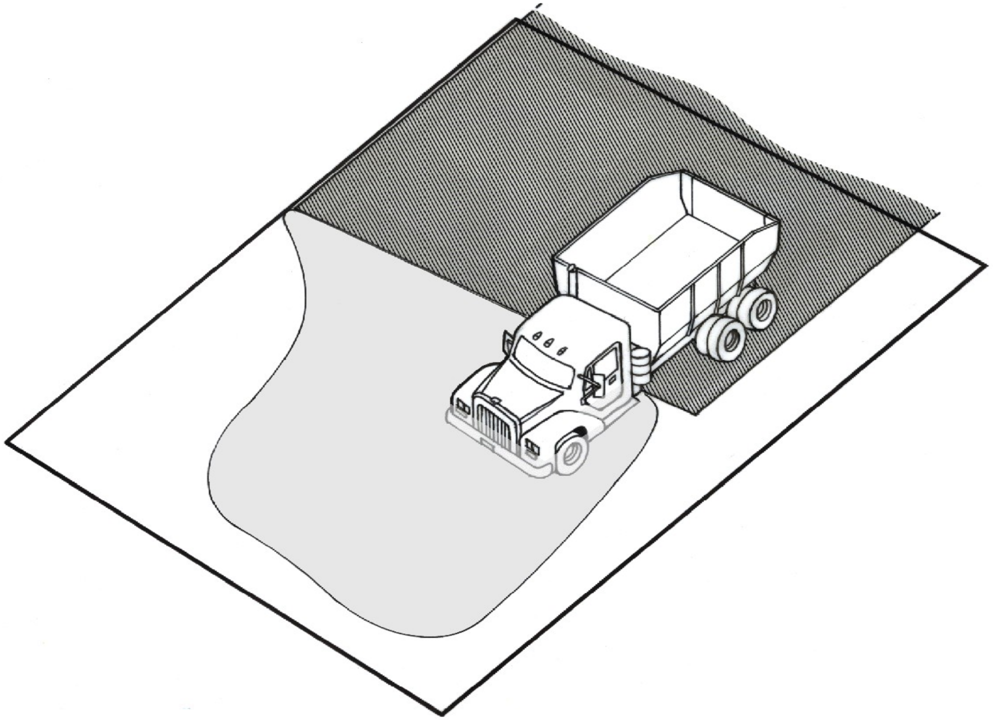
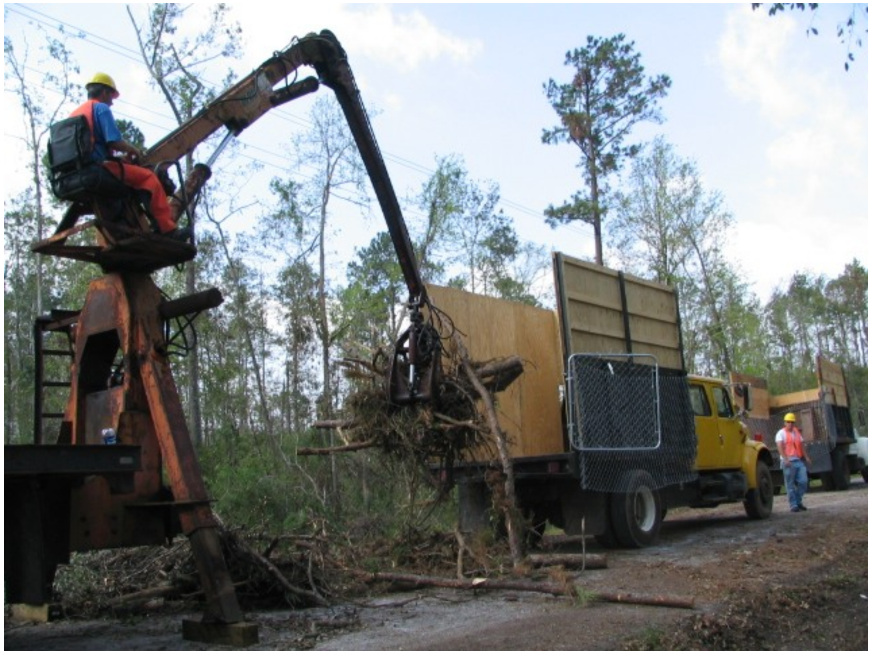
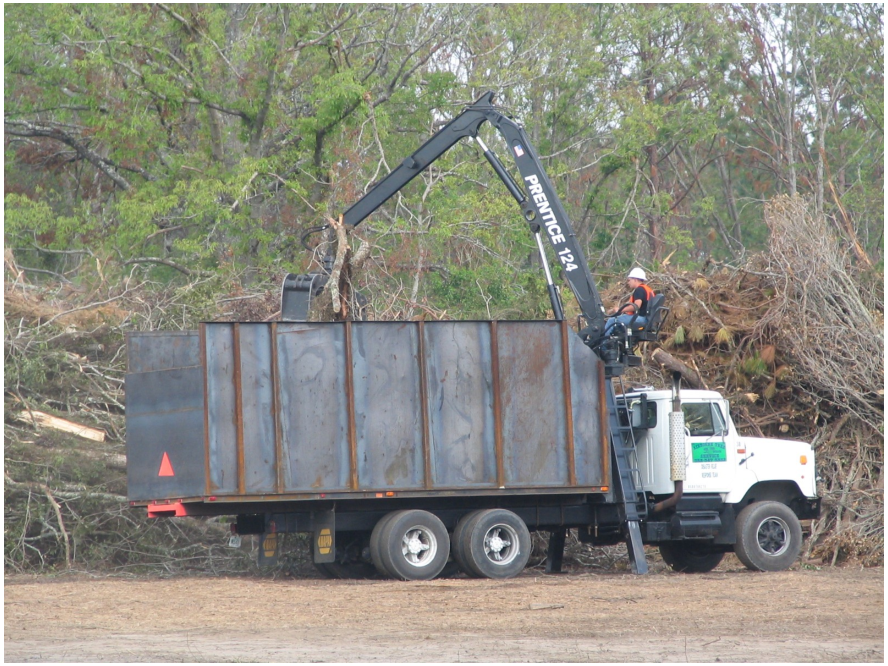


Vehicle: 5 Ton Dump Truck

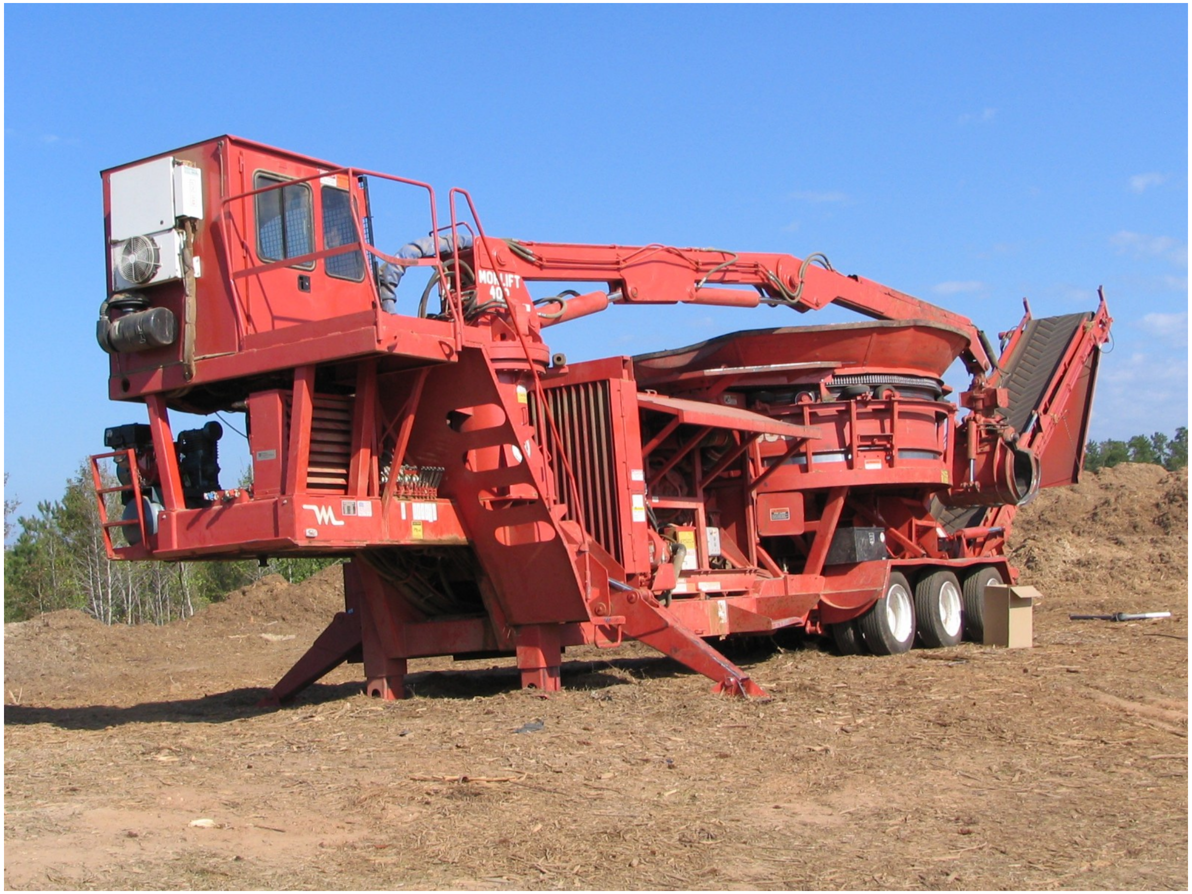
Mechanical Removal

- Self Loaders




PRENTICE 124

Chippers



Chipper Equipment and Operation

Worker apparel

- Employees in the immediate area of an operating chipper must wear personal protective equipment as required. Those feeding chippers must not wear loose clothing, gauntlet-type gloves, rings, or watches.

NO TRESPASSING
DEC 1 2005
DEC 1 2005
DEC 1 2005
DEC 1 2005

CAT
M318
CAT
GMC

KOBELCO

CATERPILLAR
252B

GEHL
5640

Bobcat
LB12
41
Bobcat
CATERPILLAR

SS6141
BLUE
ROOF

Tree Evaluation

Hardwoods: Includes Live Oaks, Water Oaks, Hybrid Oaks, Maples, etc.

- **Is the tree trunk & roots structurally in tack?**
  - If straight, standing tall & no root damage, tree will most likely survive. (Note: Live Oak trees naturally have large roots which are exposed under the tree.)
- **Are large limbs broken & missing?**
  - Most trees will have some broken branches.
  - If removing the broken branches leaves less than 50% of the tree standing, or leaves only a trunk standing, then it would be best to remove.
- **Are green leaves returning to the tree?**
  - A sign that the tree is still alive – If above items are met, leave tree.
- **If not a live oak, is the leader (top of tree) missing?**
  - If the top part of the tree is gone, best to remove the tree.
- **Has the tree split or is there rot showing in the trunk?**
  - Best to remove the tree.
- **Is 30% or more of the bark missing?**
  - Best to remove the tree.

Tree Evaluation

Pine Trees:

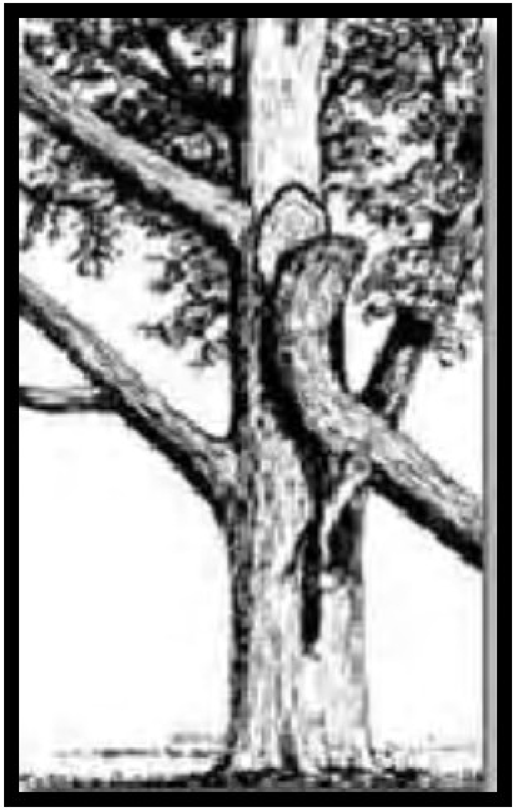
- **Is the pine tree standing tall?**
  - If alive, tree should stay.
- **Are the needles (leaves) brown?**
  - Check a branch & see if there is any green at the ends of the needles, near the base. This would be a sign the tree is alive.
- **Is the pine tree broken, leaning, split trunk or on the ground?**
  - Remove – threat to safety & will most like not survive.
- **Is 50% or more bark missing?**
  - If more than 50% bark missing, chances tree would not survive.
- **Is the leader (top of tree) missing?**
  - If the top part of the tree is gone, best to remove the tree.

Identifying the Appropriate Felling Direction

Factors to Consider

- **Clear Fall Path**
  - Along with a clear landing, this is the most important factor in deciding what direction to fell a tree. Visualize the fall path in all directions and identify those directions that are free of other trees. Finding a clear path will eliminate lodged trees, throwback, and damage to the tree being felled as well as the other trees.
- **Clear Landing**
  - Avoid felling a tree onto stumps, large rocks, or uneven ground. This will prevent cracking and other damage to the tree.
- **Lean of Tree**
  - It is generally easier and safer to fell a tree in the direction that it is already leaning. This makes for a cleaner fall and eliminates the need to use wedges, allowing gravity to do the work.
- **Ease of Removal**
  - When possible, fell the tree so the butt faces the skid road. Also, fell the tree consistent with the felling pattern of other trees. This also makes for efficient limbing and removal.
- **Slope of Ground**
  - Fell in a direction that will minimize the chance that the tree will roll or slide.

Tree Evaluation



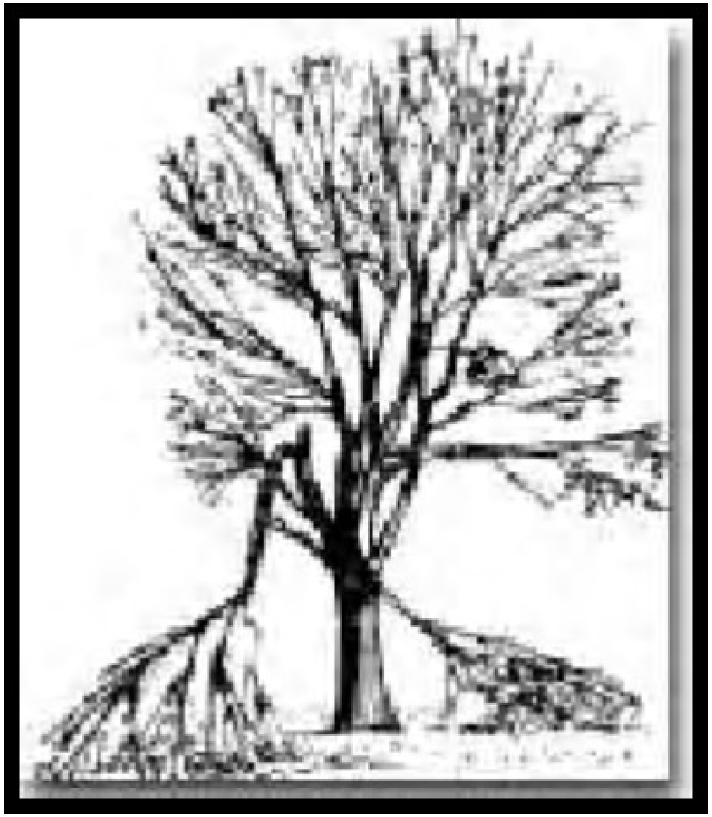
An Easy Call:

- A mature shade tree can usually survive the loss of one major limb. The broken
- branch should be pruned back to the trunk. In the months to follow, large
- wounds should be closely monitored for signs of decay

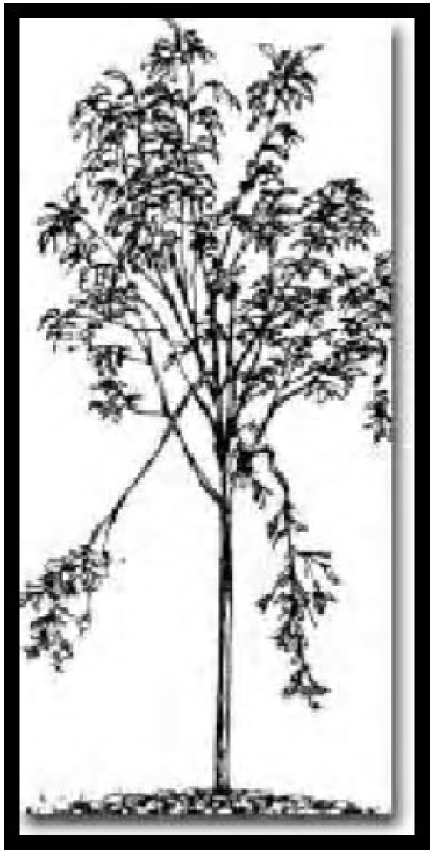
Tree Evaluation

Minor Damage:

- Although the tree has been damaged, enough strong limbs may remain on
- a basically healthy tree to make saving it possible.



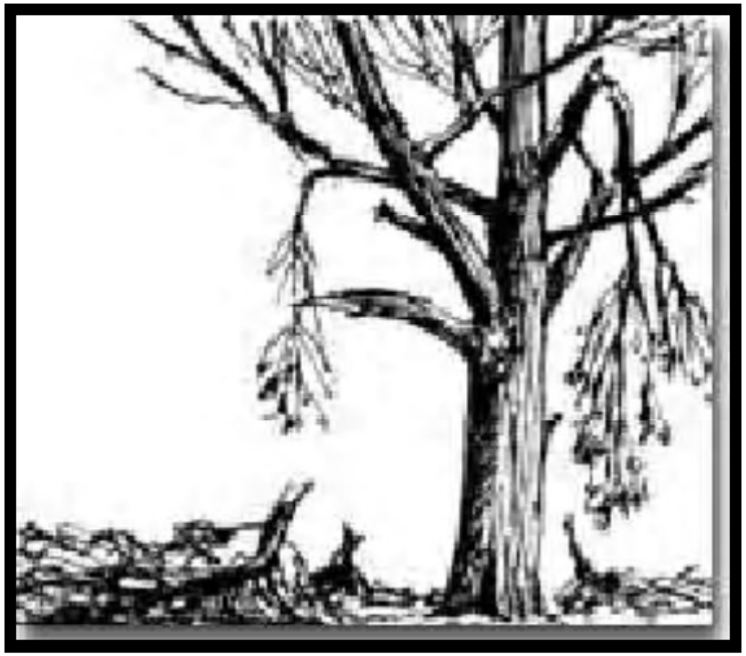
Tree Evaluation



Too Young to Die:

- Young trees can sustain quite a bit of damage and still recover quickly.
- If the leader is intact and the structure for future branching remains, remove the broken branches and let the tree close over the wounds and recover itself.

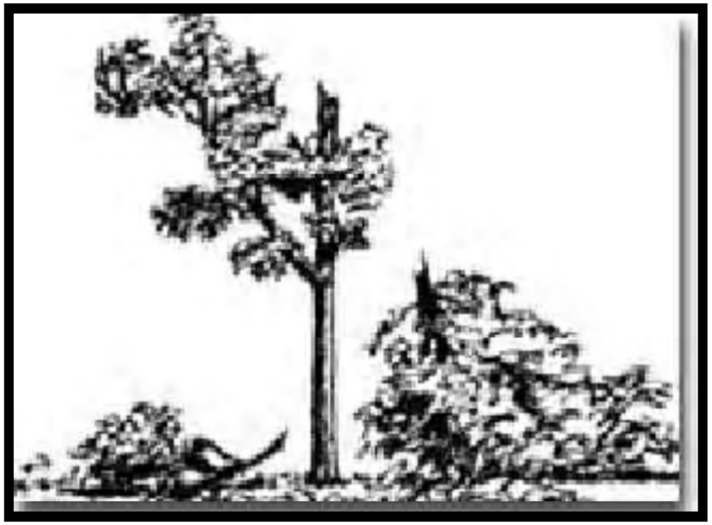
Tree Evaluation



Hold Off:

- A healthy mature tree can recover even when several major limbs are damaged.
- With large trees, a professional arborist should be brought in to assess damage on a borderline situation, and to safely accomplish needed pruning and branch removal.

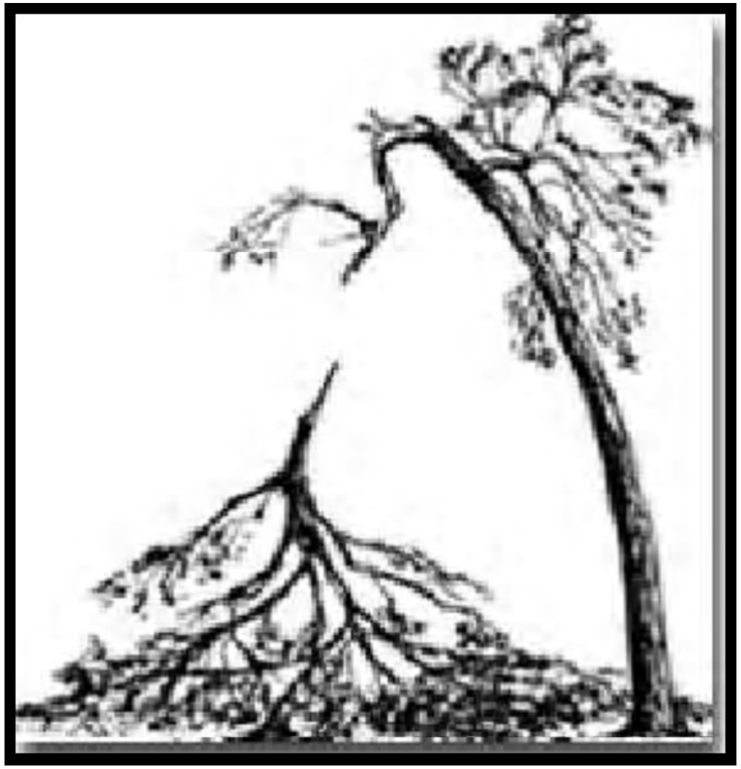
Tree Evaluation



Tree Tragedy:

- This otherwise healthy young tree has lost too much of its crown the leafy head that is vital for survival. It will probably not be able to grow enough new branches and leaves to provide needed nourishment, and will never be able to regain its former beautiful shape.

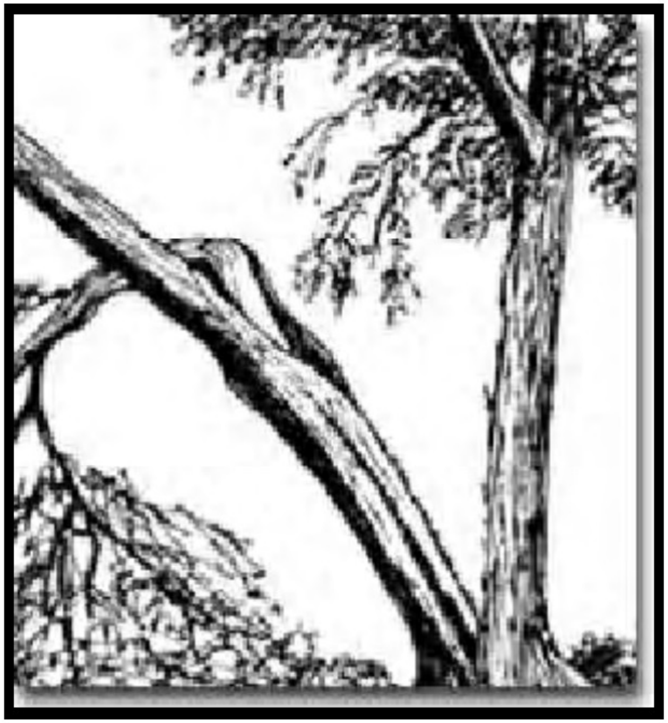
Tree Evaluation



Hopeless Case:

- About all that’s left of this tree is its trunk.
- The few remaining branches can’t provide enough foliage to enable the tree to make it through another growing season.

Tree Evaluation



Farewell to a Friend:

- A rotten inner core in the trunk or structural weakness in branching patterns can cause a split trunk the tree equivalent of a heart attack.
- The wounds are too large to ever mend, and the tree has lost its sap lifeline between roots and leaves. This tree is all but dead.